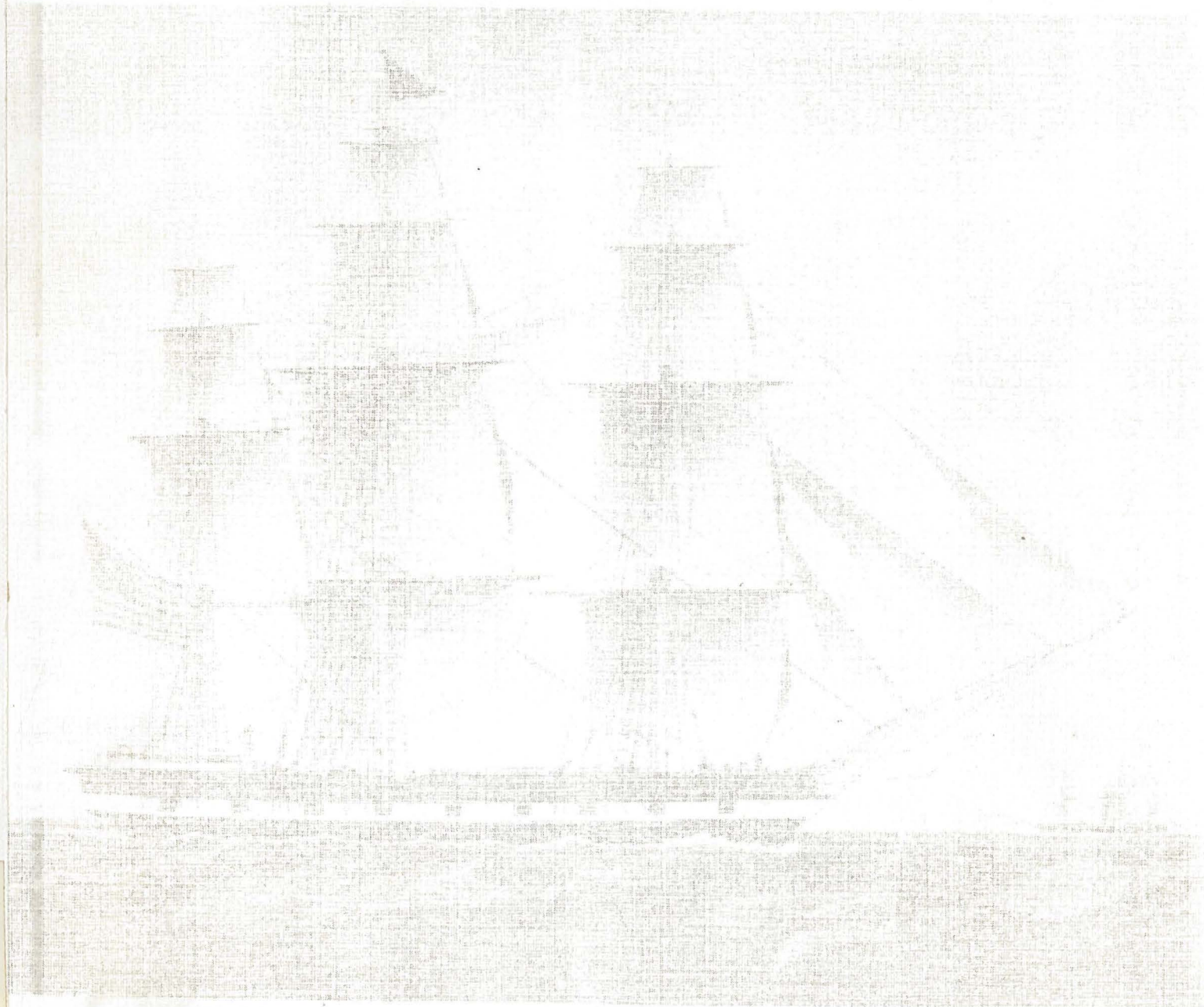
Down She Went

A Report on the Excavation and Analysis of the Gold Rush-Era Ship *Rome* San Francisco, California



William Self Associates
Orinda, California

March 1996

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A Report on the Excavation and Analysis of the Gold Rush-Era Ship *Rome* San Francisco, California

Prepared For

City of San Francisco
Federal Transit Administration
State Office of Historic Preservation
Advisory Council on Historic Preservation

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March 1996

Ship *Rome* Leaving Marseilles 1848 Captain Samuel R. Curwen

Watercolor by Honore Pellegrin 1848, Courtesy, Peabody Essex Museum, Salem, MA.

Table of Contents

List of Figures

List of Photos

Appendices

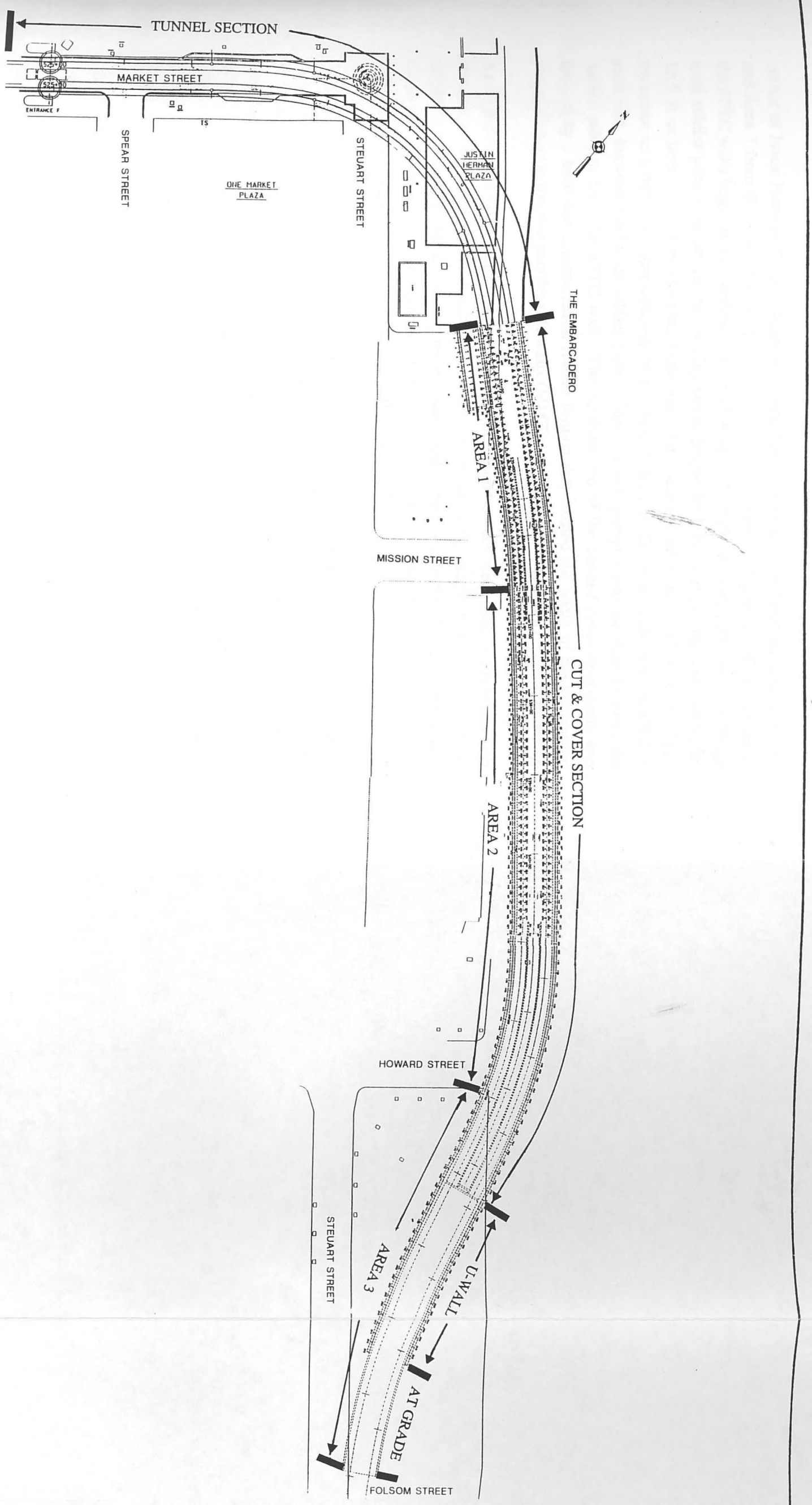
1.0 PROJECT LOCATION AND DESCRIPTION

In the Fall of 1993, excavation began for an expansion of the San Francisco Municipal Railway (MUNI). The project, designated the Muni Metro Turnback Project (MMTP), connects the existing MUNI Metro subway system's Embarcadero Station with the planned extension of MUNI Metro to Sixth Street. The MMTP extends the existing MUNI subway terminus at the Embarcadero Station east underground toward the foot of Market Street. Beneath Justin Herman Plaza, the project alignment curves to the south and continues beneath The Embarcadero, gradually returning to the surface at the intersection of Folsom and Steuart Streets. The MMTP was constructed in four phases: 1) an 840 ft. tunnel section beneath Justin Herman Plaza; 2) a 1,100 ft. cut-and-cover section down The Embarcadero roadway from north of Mission Street to south of Howard Street; 3) a 380 ft. "U-Wall" section rising to grade from south of Howard Street to Folsom Street and 4) a 160 ft. at-grade section that connects to MUNI tracks at Steuart and Folsom Streets (Figure 1).

As required in Section 106 of the National Historic Preservation Act of 1966, cultural resources likely to be encountered by the project were identified as part of the Final Environmental Impact Statement (FEIS). A Programmatic Agreement (PA) for the project was subsequently executed between the Federal Transit Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the San Francisco Public Utilities Commission. As stipulated in the PA, an Archeological Monitoring and Data Recovery Plan (AMDRP) was developed to address the archeological properties that might be encountered during project excavation and the constraints imposed on archeological data recovery by the nature of project construction. The AMDRP required development of a Research Design to explicitly discuss the types and variety of cultural materials identified in the FEIS that were likely to be encountered during project excavations, and to identify research themes that could be addressed by these materials.

1.1 Construction Background

Project excavation commenced in November, 1993 with construction of two parallel, concrete slurry walls (SPTC walls) that formed the basis of the cut-and-cover shoring system. For excavation purposes, the cut-and-cover and "U-Wall" segments of the project alignment were considered as a single entity and were subdivided into three areas: Area 1 extended from the



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March 1996

Figure 1

Project Alignment

corner of Justin Herman Plaza to Mission Street, Area 2 from Mission Street to Howard Street, and Area 3 from Howard Street to grade at Folsom Street (refer to Figure 1). Construction of the SPTC walls began in the northern portion of Area 1. To build the walls, 36 inch-wide flange steel soldier piles were driven into bearing strata, below the bottom of planned excavation, on 12.5 ft centers. Soil was removed from the "slot" between each pile with a "clam shell" excavator to a depth of approximately 60 ft. Intermediate soldier piles were then installed in each slot, between the initial soldier piles. Concrete was pumped into the slots between the soldier piles to form the SPTC wall. The northern end of the cut-and-cover excavation was defined by a bulkhead constructed in similar fashion that crossed the width of the excavation, perpendicular to the two parallel side walls (MMTP AMDRP 1992, sec. 3.1)(Figure 2; Photo 1).

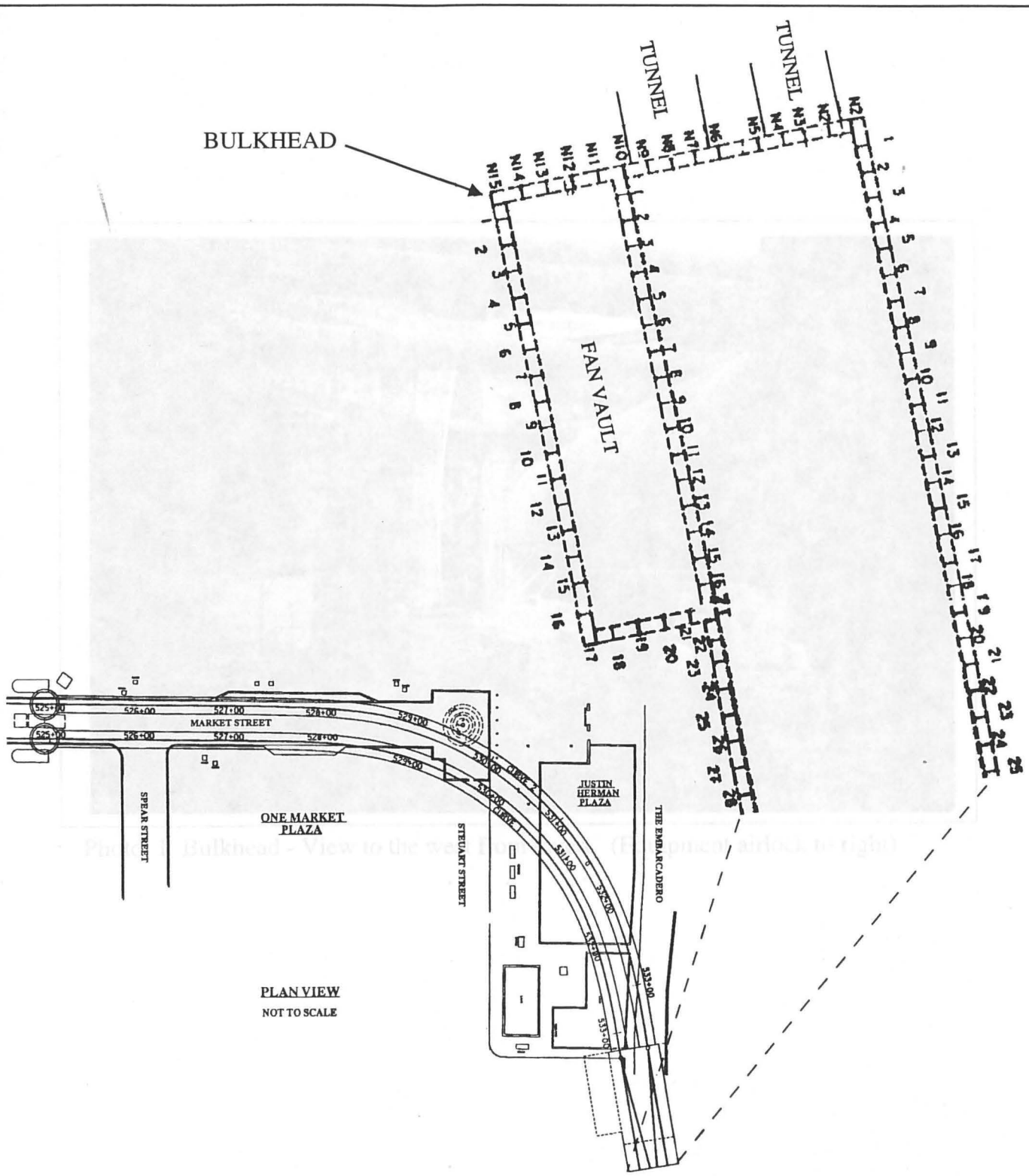
As sections of the SPTC walls were completed, excavation between the parallel walls began with removal of the street level asphalt/concrete layer. As excavation proceeded in stair-step fashion along the project alignment, a bracing system was installed between the SPTC walls. The bottom of the excavation was reached approximately 40 ft. below street grade (BS), where a reinforced concrete floor was poured (MMTP AMDRP 1992, sec. 3.2).

In order to minimize impacts to the BART tunnels beneath Market Street and Justin Herman Plaza, and to reduce the potential for disturbance of park lands and traffic along The Embarcadero, tunneling (rather than cut-and-cover excavation) was selected as the preferred excavation method beneath Justin Herman Plaza and Market Street (MMTP AMDRP 1992, sec. 6.2). The presence of bay mud, unclassified, highly permeable fill, and high groundwater levels required the constant application of compressed air at the face of the tunnel excavation to keep groundwater and unconsolidated fill out of the tunnel. This necessitated the use of an open face tunnel shield equipped with breast jacks, rather than a closed-face tunneling machine.

1.2 Tunnel Excavation

By late September 1994, Area 1 of the cut-and-cover section had been excavated, the concrete floor and northern concrete bulkhead had been constructed, and the tunnel shield, air locks, and other tunnel-boring equipment had been installed at the face of the bulkhead wall. The bulkhead was broken through and tunneling commenced in October 1994.

The northernmost of two parallel tunnels was driven first, beginning at the cut-and-cover bulkhead and continuing underground toward Market Street on a curve to the northwest. As it



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SAN FRANCISCO, CALIFORNIA

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March 1996

Figure 2

Bulkhead Location
(Detail)

Photo 1 Bulkhead - View to the west from invert (Equipment airlock to right)

approached Market Street, the alignment curved to the west, then, below Market, to the southwest where it continued on to meet the bulkhead of the Embarcadero MUNI station (Figure 3).

To stabilize the tunnel face within the shield during excavation, breast boards measuring approximately 3 in. x 10 in. x 5 ft. were held in place across the 18.5 ft diameter tunnel face with hydraulic breast jacks attached to the tunnel shield.

Excavation of the tunnel face occurred in cyclical fashion with the sequential removal of a breast board, excavation of the soil to a depth equal to that of the tunnel shield, and replacement of the board prior to removal of another. In this manner, the tunnel face was breasted at all times, except for the 10 in. x 5 ft. portion being excavated. When the entire tunnel face had been excavated, the tunnel shield was advanced into the soil matrix, around the breast boards, and the excavation cycle was repeated. This open face shield approach to tunneling required that all materials, including cultural resources, be removed through the relatively small openings created during excavation (MMTP AMDRP 1992). As the tunnel shield advanced into the fill and bay mud, segments of steel tunnel lining rings were assembled in the tail of the shield. As the shield advanced, the rings were bolted onto sections previously erected to form the cylindrical tunnel walls (Bechtel 1991: 5-12) (Figure 4).

Spoils from the tunnel excavation were loaded by conveyor belt into small mining cars that were transported to an equipment air lock at the tunnel entrance. Through the air lock, the mining cars were removed from the pressurized tunnel environment, lifted by crane to the surface, and emptied into a "muck bin" prior to their removal from the site to a contract landfill site (Photos 2-5).

Inspection of spoils deposited in the "muck bin" indicated that the initial tunnel excavation in the months of October and November was largely through sterile bay mud. Consequently, little in the way of cultural material was recovered during this period. The absence of cultural deposits, the nature of the compressed-air environment, and the tightly-confined work space at the tunnel face precluded the presence of an archeological monitor in the tunnel, in accordance with the AMDRP. Monitoring was conducted on the surface through by routinely inspecting the contents of the mining cars after they were emptied into the "muck bin". A reasonably accurate provenience for the spoils was maintained by recording the depth and the horizontal position of the tunnel shield as excavation proceeded. Close communication with supervisory personnel managing the tunnel excavation greatly aided this process.

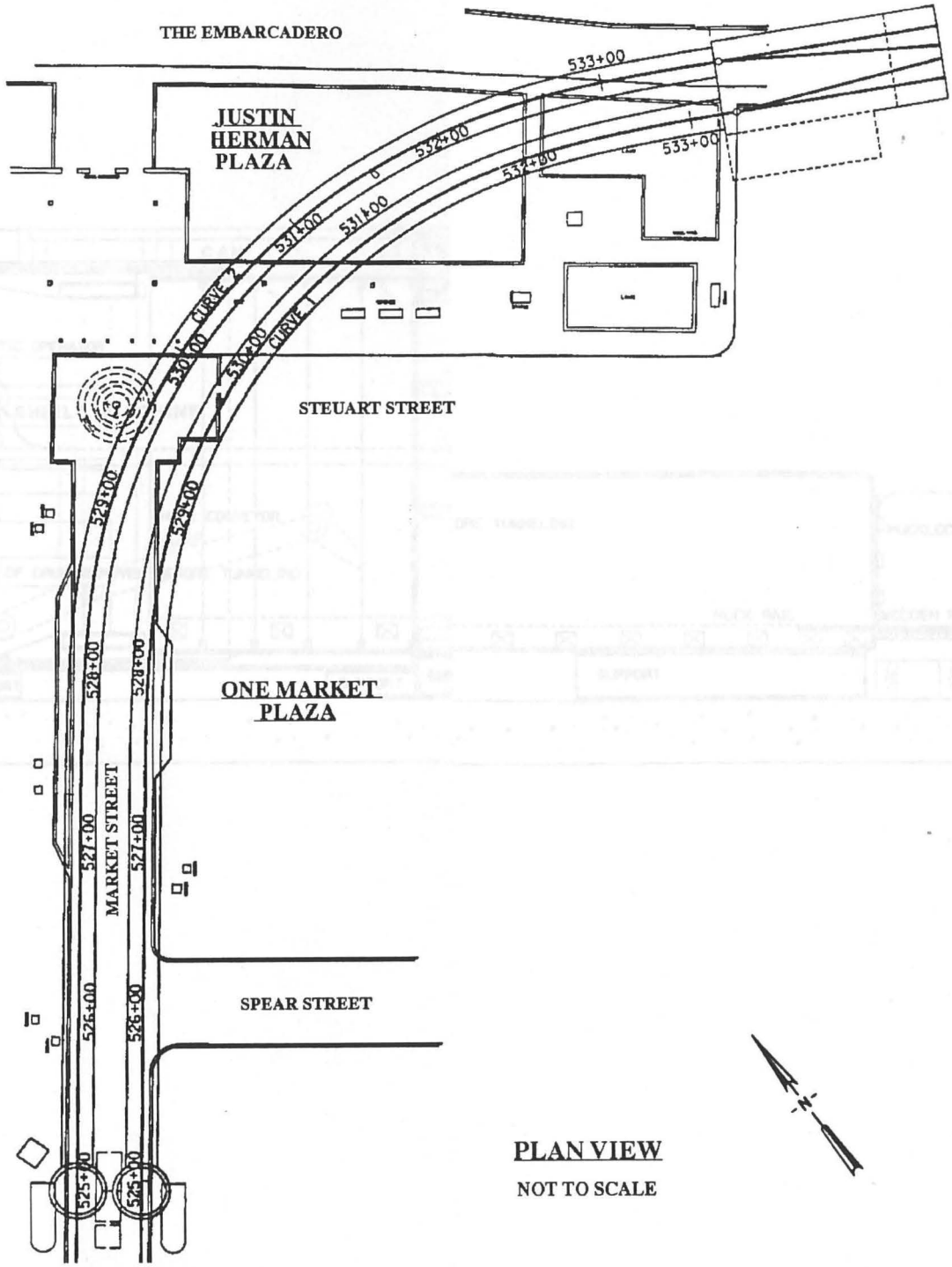

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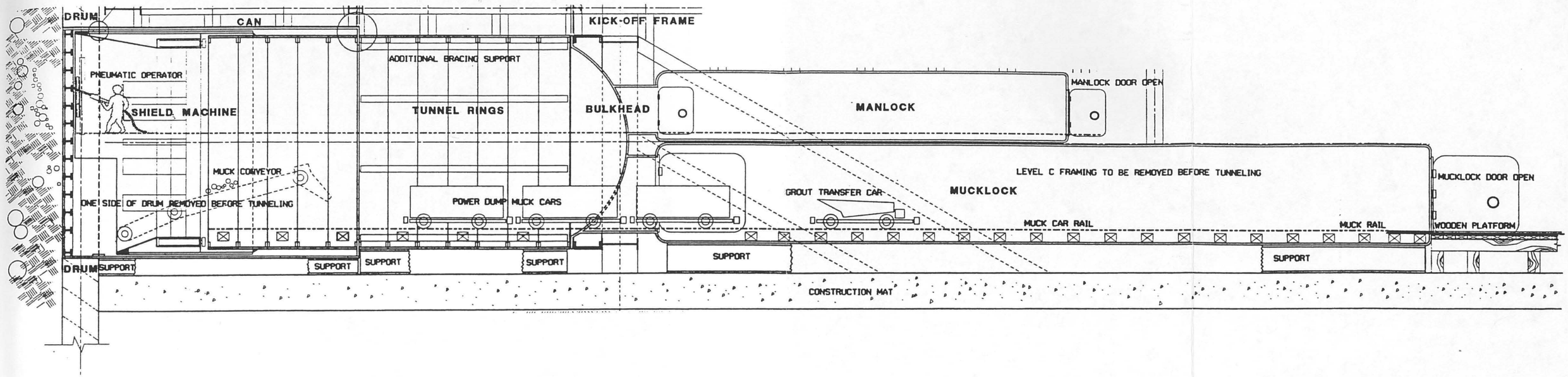
Figure 3

Tunnel Alignment
(Detail)



Not to Scale

Source: Bechtel Engineering

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Figure 4

Tunneling Machine

Photo 2 Air lock

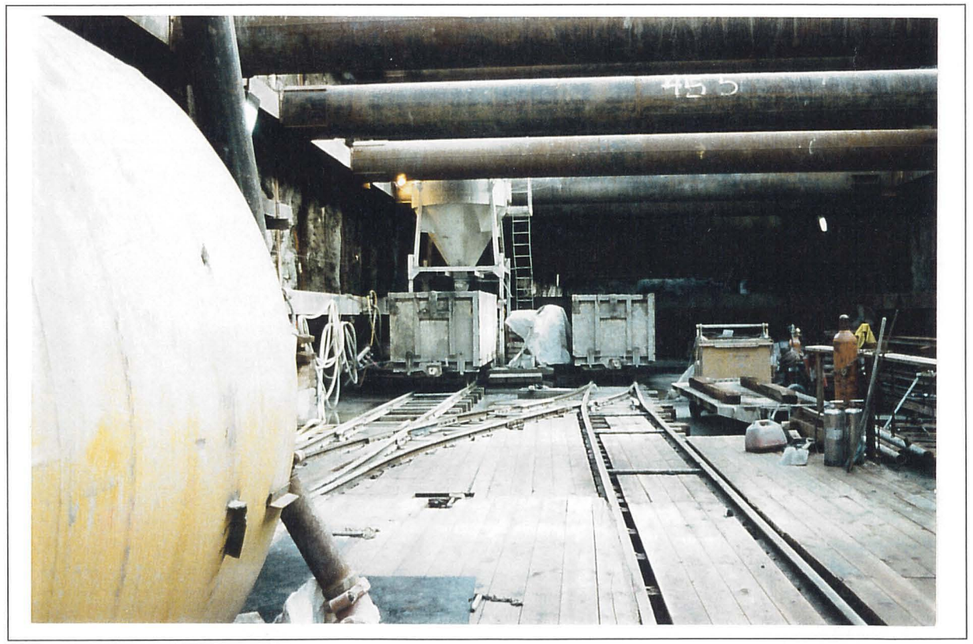


Photo 3 Mining cars - view to east from invert

Photo 2 Air lock

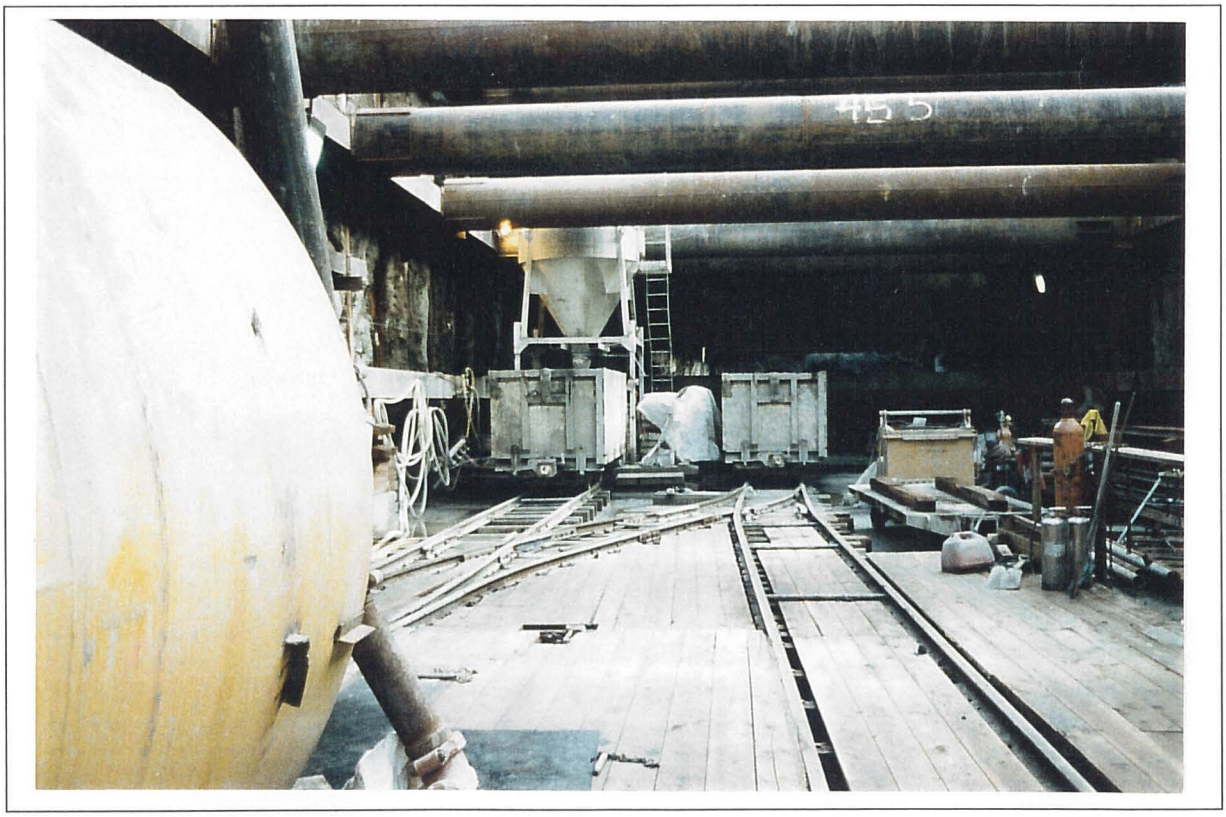


Photo 3 Mining cars - view to east from invert

Photo 4 Air locks - view to northwest from invert

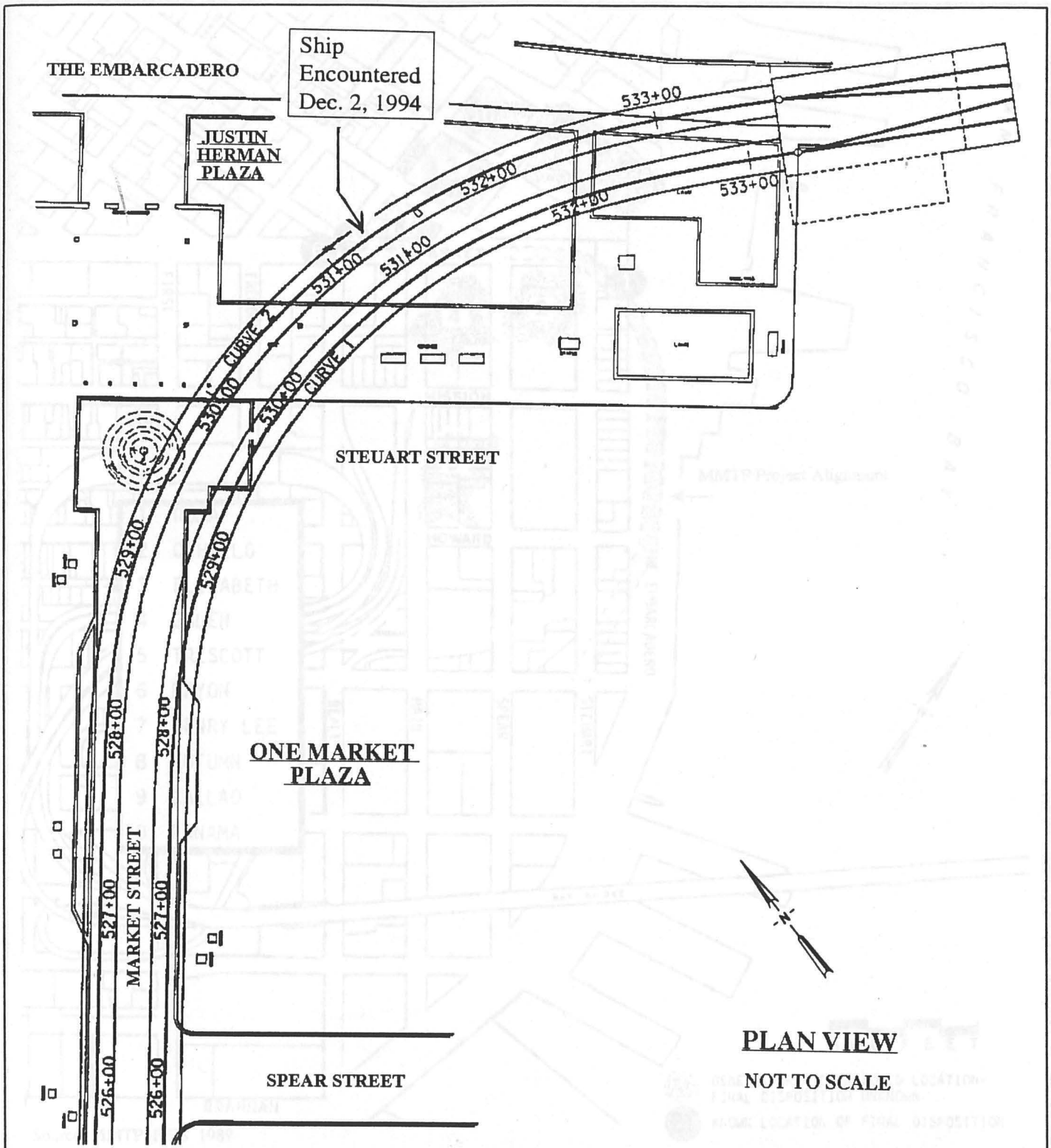
Photo 5 Muck bin

2.0 HISTORIC FEATURE

2.1 Discovery and Exposure of Ship

On December 1, 1994, a large cast iron anchor, lying in a horizontal position, was exposed in the tunnel face. As excavation continued, a stud-link anchor chain attached to the anchor ring was found. The chain continued into the fill beyond the tunnel shield. On December 2, 1994, MMTP management notified William Self Associates (WSA), project archeologist, that a portion of what appeared to be the hull of an historic ship had been encountered that day during tunneling operations at a depth of approximately 35 ft. BS, at the approximate location of engineering station 531+23 (Figure 5). Tunneling operations were suspended for the remainder of the day while plans were developed to address both safety considerations and the data recovery techniques to be used as the tunnel advanced through the ship. In accordance with AMDRP Section 4.2-C.4(d), construction management and archeologists from William Self Associates met on December 3, 1994 to develop an appropriate course of action. During this meeting, historic background material prepared for both the project FEIS, the AMDRP, and the AMDRP Final Research Design were reviewed. Reference was made to a figure taken from the MMTP FEIS, which illustrates the known or assumed locations of ten Gold Rush-era ships sunk in the vicinity of the project alignment (Figure 6). Of these, two ships, the *Rome* and the *Othello* had previously been identified as being the most likely to be located in the vicinity of the tunnel.

The proximity of the ship to the historic location of the *Rome*, as discussed below, prompted a preliminary identification of the ship as being the *Rome*. Still photographs and videotape of the vessel were examined during the course of the meeting. These depicted the copper-sheathed lower portion of a ship's hull, visible from about the mid-line of the tunnel face to the bottom of the tunnel shield. The upper part of the tunnel face, above the line of sheathing, consisted of a heavy mud and clay matrix in which were embedded exposed wooden frame sets from the ship's interior. It appeared that the wooden hull planking that should have been attached to and covering these frames above the line of copper sheathing had been removed or had rotted away. On the right side of the tunnel face and adjacent to the hull was an intrusive vertical wood piling. Because the excavation had encountered the ship at the approximate waterline of the hull, virtually the entire tunnel face was filled by the hull, precluding the need for breast boards and enhancing the visibility of the hull (Photos 6-10).



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SAN FRANCISCO, CALIFORNIA

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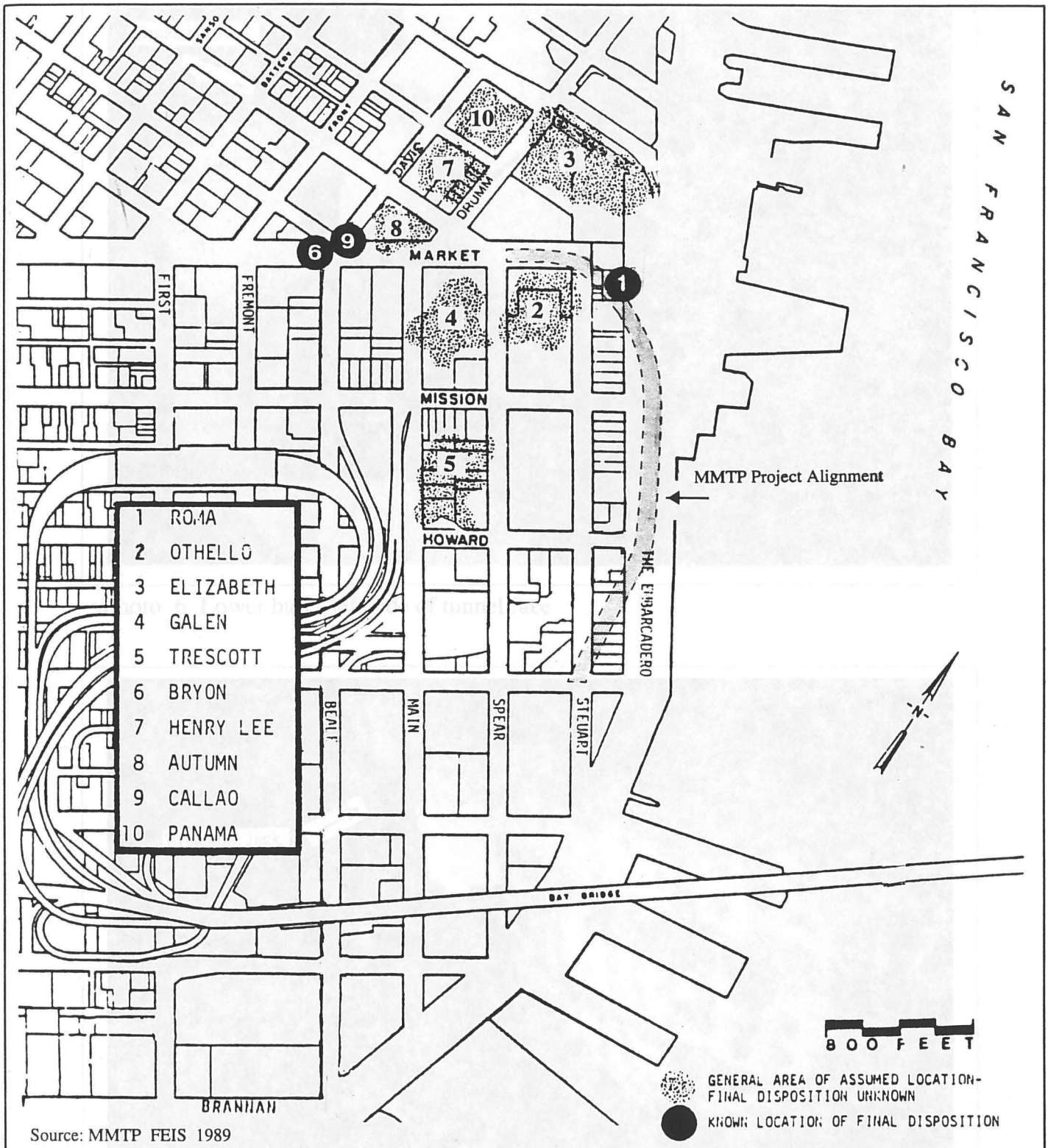
March 1996

Figure 5
Location of Ship



Source: MMTP FEIS 1989

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March 1996

Figure 6

Locations of Sunken Gold Rush-Era Ships

Photo 6 Lower hull - left side of tunnel face

Photo 7 Lower hull - view to the south

Photo 8 Lower hull - right side of tunnel

Photo 9 Lower hull - view to north

Photo 10 Detail of frames embedded in bay mud

At the conclusion of the meeting, WSA archeologists requested that specific measurements, photographs, and videotape be taken of the exposed hull fabric prior to the resumption of tunneling. Construction management agreed to facilitate this request. The results of this meeting were then transmitted to the State Office of Historic Preservation per Section 6.3 of the AMDRP Final Research Design.[1]

2.2 Excavation Through Ship's Hull

Anticipating that excavation through the apparently rotten hull planking and timbers would consist of cutting through and removing intact sections of sheathing, planking, and frames, WSA archeologists requested supervisory personnel in the tunnel to mark the copper sheathing so that it, and the underlying hull planking and frames, could be correlated on the surface with a pre-disturbance drawing of the exposed hull. Although this was attempted, the paint used to mark the hull sections created noxious fumes in the pressurized tunnel environment so the effort was discontinued. The paint marks that were applied were obscured during the excavation and muck-removal process, so this approach to documentation was abandoned. It was then jointly decided that the most expedient method of obtaining documentation would be through first-hand observation of the excavation. The archeological monitors subsequently began the process of obtaining medical clearance and safety training to enter the pressurized tunnel environment.

Tunneling efforts resumed on December 5th. The tunnel shield had first encountered the hull at an angle, so the hull slanted slightly away from the tunnel shield from left to right, with the left edge and left upper portion of the shield nearly touching the exposed hull. Construction personnel notched the hull in the area of the shield's left edge to allow advancement of the shield. The central portion of the tunnel face above the line of copper sheathing was breasted, and, as the hull fabric was pierced and the sheathing, planking, and interior frames removed, breast boards were reinstalled to hold the soft, unconsolidated sand and clay that filled the ship's interior.

On December 6th, 1994, the first structural members from the ship were recovered from the "muck bin". Pieces of hull planking, futtock fragments, copper sheathing, and ceiling planking were retrieved.[2] It was quickly determined that sifting through the muck to locate and retrieve

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[1] A copy of this letter may be found in Appendix A.

[2] A glossary of ship construction terminology may be found in Appendix B.

elements of the ship was relatively unsafe due to the depth of the mud in the bin and its inability to support standing weight. This, in conjunction with the requirement to deliver only clean, uncontaminated excavation spoils to the landfill site, prompted construction management to delegate responsibility for retrieving the ship remains to construction personnel. Mechanized equipment was used to recover the larger ship remains from each mining car prior to the dumping of its contents into the "muck bin", while the smaller ones were recovered by hand. The remains were then pallatized and moved to an isolated location in the project area where WSA archeologists cleaned, inspected, and documented them.

Medical clearance enabling the archeological monitors to enter the tunnel was also obtained on December 6th, 1994. Having received this clearance and the mandatory safety orientation for personnel working in the tunnel, the monitors were authorized to enter the pressurized tunnel environment at will to observe the excavation through the ship. This greatly enhanced the possibility that the remains could be later correlated with a predisturbance estimation of the hull's configuration.

In their initial observation of the excavation, archeologists identified what appeared to be a substantial deck clamp attached to the inside of the frames. Although the tunnel face was almost completely breasted, it appeared that the clamp crossed the face of the tunnel excavation at its approximate mid-line. Later analysis suggested this may also have been a portion of a breast hook. Archeologists also examined the relationship between the bottom of the tunnel shield and the exposed portion of the ship's lower hull and determined that the shield (and consequently the bottom of the tunnel excavation) would pass beneath the ship's keel; this meant that portions of the entire keel and keelson could be recovered during tunneling.

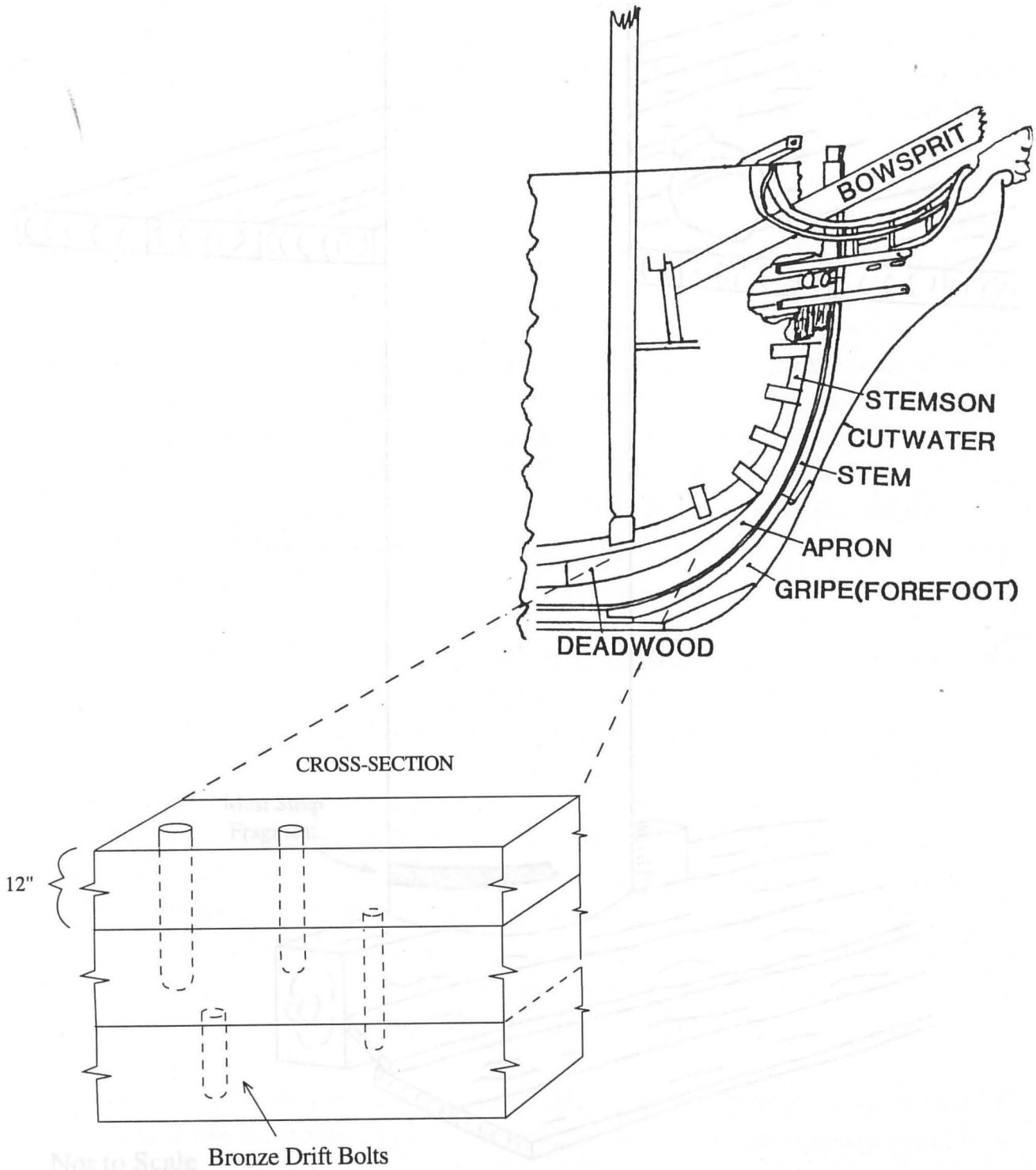
As excavation through the hull continued, it became clear that construction management's initial assumption regarding the integrity of the hull fabric was incorrect. What was at first perceived as being rotten wood, based on examination of the exterior surface of the exposed wooden frames, proved to be wood of substantial integrity. The hull planking that had been protected with copper sheathing and a thin layer of furring planking was extremely hard, as were the futtocks comprising the frame sets, and the ceiling planking that protected the interior sides of the frames from the decaying effects of the mud and sand that had filled the ship's interior since its intentional sinking in 1852. Chain saws, hand axes, sledge hammers and chisels were all employed, with varying degrees of success, in attempts to reduce the hull structure into pieces small enough for extraction through the openings afforded by the removal of each breast board.

The pneumatic chain saws proved to be inadequate, as the hardness of the wood quickly dulled the cutting teeth and caused the saws to bind and buck, slowing the process and jeopardizing the safety of the operators. To address this, a hydraulic pile cutter (or grinder) was installed on the arm that held the "muck bucket", the backhoe-like shovel that was used to pull the excavation spoils onto the conveyor belt at the bottom of the shield. Rather than cutting through the wood, the pile cutter ground the wood into fine sawdust as it passed over the ship remains on an arc across the tunnel face. Because the arm did not reach the sides of the shield, chain saws continued to be used at the edges of the excavation. While this tool enhanced the tunnel excavation process, it reduced some of the ship's timbers to powder, destroying their archeological integrity and eliminating the possibility that the structural members could be analyzed on the surface. Given the tunneling safety concerns, this effect was unavoidable.

As the excavation progressed through the ship, the flat floors, keelson, and keel of the ship presented formidable obstructions to the forward progress of the tunnel. The floors were fastened to the keel with numerous bronze or copper drift bolts which could only be extracted with considerable effort. This, in combination with the hardness of the wood, slowed the excavation to a virtual crawl. The grinder could not be used in those areas where the heavy metal fasteners might be encountered so chainsaws were redeployed in conjunction with hand axes, chisels, and hammers as the excavation crossed the bottom of the hull. The drift bolts were either extracted with the hydraulic arm of the "muck bucket" or literally chopped out of the wood by hand.

On December 12, 1994, heavy, composite timbers, stacked and fastened one upon the other, were encountered. Although visibility was severely restricted, these appeared to be oriented perpendicularly to the run of the floors. Presumably these were portions of the deadwood, apron and forefoot, although their exposure was never sufficient to allow positive identification (Figure 7).

It was not until December 13, 1994 that the full excavation reached the centerline of the ship, whereupon the foremast was exposed. The mast was stepped on the keelson, with a mast chock on the aft side. The limber board was clearly evident, angled at about 45° to the keelson. Aft of the mast, the edge of the deck planking was exposed. Prior to uncovering the foremast, no evidence of a deck had been observed (Figure 8). It appeared, in retrospect, that the portion of deck running from the foremast to the bow had likely been removed prior to the ship's sinking.



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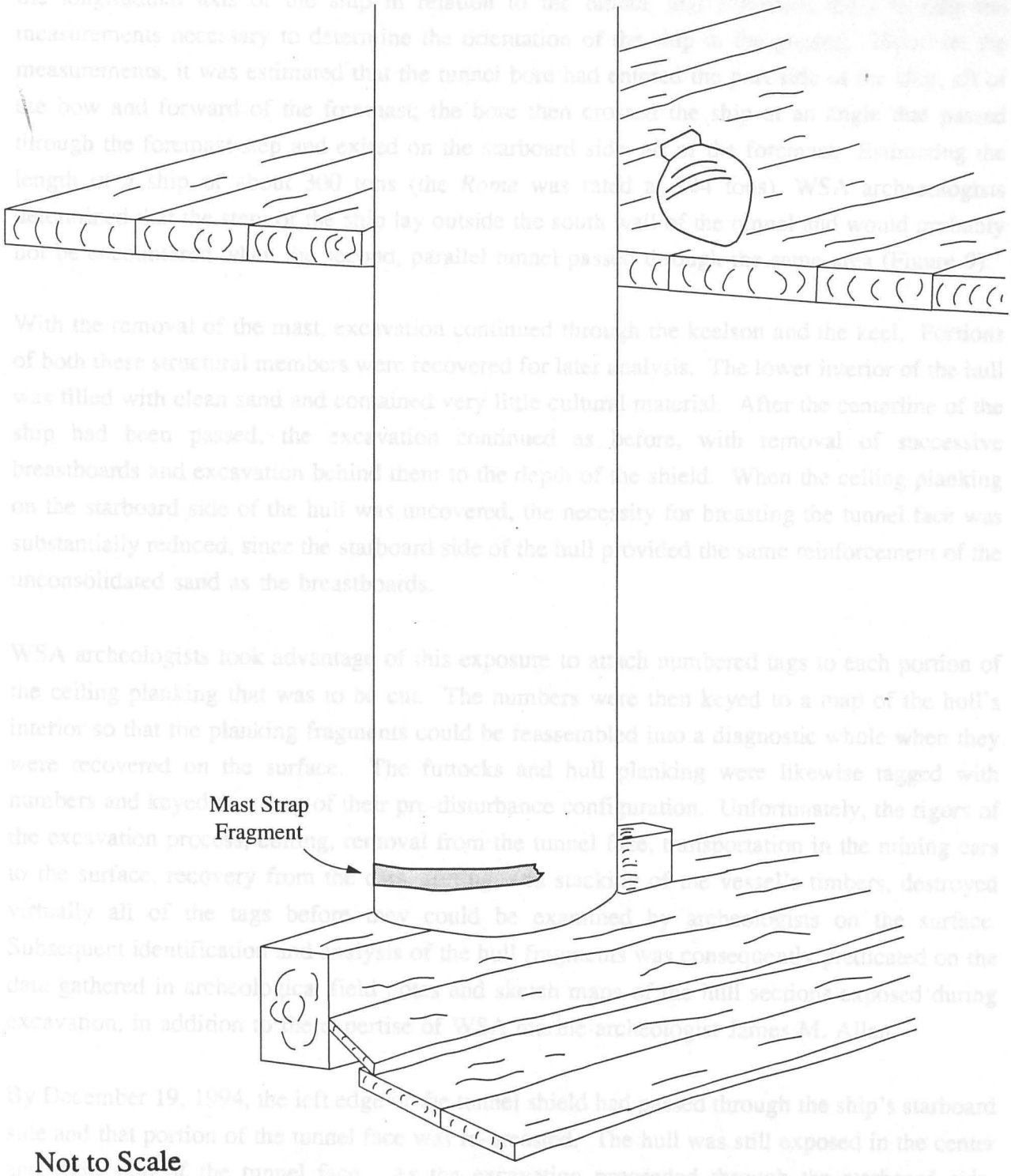
Documented Remains of Ship *Rome*

Figure 7
Composite Timbers
(Presumed portion of apron, forefoot & deadwood)



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Documented Remains of Ship *Rome*

Figure 8

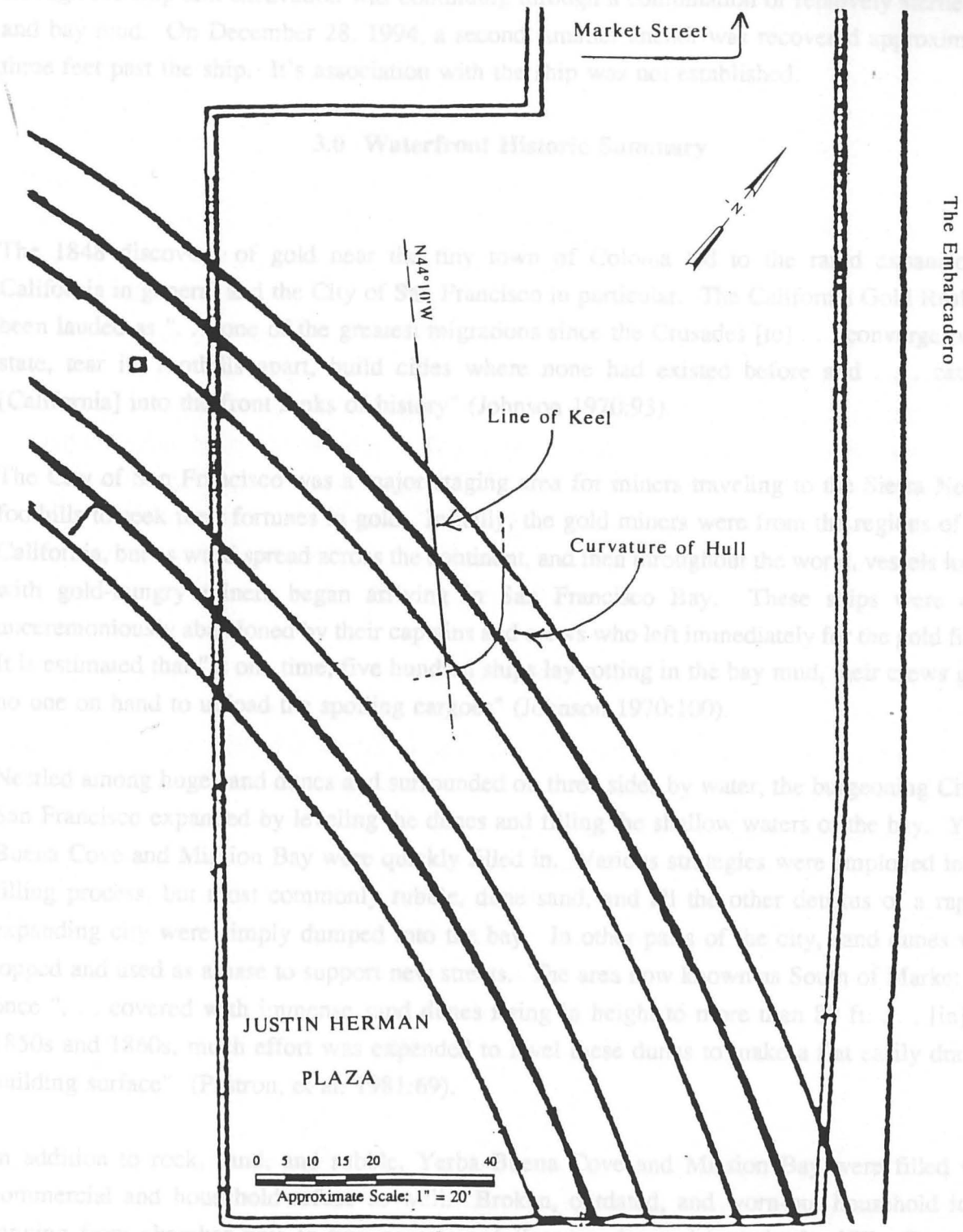
Mast, Keelson, Garboard and Deck

The exposure of the mast, keelson, and keel allowed archeologists to determine (approximately) the longitudinal axis of the ship in relation to the tunnel, and permitted them to take the measurements necessary to determine the orientation of the ship in the ground. Based on the measurements, it was estimated that the tunnel bore had entered the port side of the ship, aft of the bow and forward of the foremast; the bore then crossed the ship at an angle that passed through the foremast step and exited on the starboard side, aft of the foremast. Estimating the length of a ship of about 300 tons (the *Rome* was rated at 344 tons), WSA archaeologists determined that the stem of the ship lay outside the south wall of the tunnel and would probably not be encountered when the second, parallel tunnel passed through the same area (Figure 9).

With the removal of the mast, excavation continued through the keelson and the keel. Portions of both these structural members were recovered for later analysis. The lower interior of the hull was filled with clean sand and contained very little cultural material. After the centerline of the ship had been passed, the excavation continued as before, with removal of successive breastboards and excavation behind them to the depth of the shield. When the ceiling planking on the starboard side of the hull was uncovered, the necessity for breasting the tunnel face was substantially reduced, since the starboard side of the hull provided the same reinforcement of the unconsolidated sand as the breastboards.

WSA archeologists took advantage of this exposure to attach numbered tags to each portion of the ceiling planking that was to be cut. The numbers were then keyed to a map of the hull's interior so that the planking fragments could be reassembled into a diagnostic whole when they were recovered on the surface. The futtocks and hull planking were likewise tagged with numbers and keyed to a map of their pre-disturbance configuration. Unfortunately, the rigors of the excavation process, cutting, removal from the tunnel face, transportation in the mining cars to the surface, recovery from the cars, sorting, and stacking of the vessel's timbers, destroyed virtually all of the tags before they could be examined by archeologists on the surface. Subsequent identification and analysis of the hull fragments was consequently predicated on the data gathered in archeological field notes and sketch maps of the hull sections exposed during excavation, in addition to the expertise of WSA marine archeologist James M. Allan.

By December 19, 1994, the left edge of the tunnel shield had passed through the ship's starboard side and that portion of the tunnel face was re-breasted. The hull was still exposed in the center and right side of the tunnel face. As the excavation proceeded through the starboard side, relatively dense concentrations of cultural debris were encountered on the exterior side of the



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SAN FRANCISCO, CALIFORNIA
March 1996

Figure 9

Orientation of Ship

ship. By December 27, 1994 at engineering station 530.88, the entire tunnel shield had passed through the ship and excavation was continuing through a combination of relatively sterile sand and bay mud. On December 28, 1994, a second, smaller anchor was recovered approximately three feet past the ship. It's association with the ship was not established.

3.0 Waterfront Historic Summary

The 1848 discovery of gold near the tiny town of Coloma led to the rapid expansion of California in general and the City of San Francisco in particular. The California Gold Rush has been lauded as ". . . one of the greatest migrations since the Crusades [to] . . . converge on the state, tear its foothills apart, build cities where none had existed before and . . . catapult [California] into the front ranks of history" (Johnson 1970:93).

The City of San Francisco was a major staging area for miners traveling to the Sierra Nevada foothills to seek their fortunes in gold. Initially, the gold miners were from the regions of Alta California, but as word spread across the continent, and then throughout the world, vessels loaded with gold-hungry miners began arriving in San Francisco Bay. These ships were often unceremoniously abandoned by their captains and crews who left immediately for the gold fields. It is estimated that "at one time, five hundred ships lay rotting in the bay mud, their crews gone, no one on hand to unload the spoiling cargoes" (Johnson 1970:100).

Nestled among huge sand dunes and surrounded on three sides by water, the burgeoning City of San Francisco expanded by leveling the dunes and filling the shallow waters of the bay. Yerba Buena Cove and Mission Bay were quickly filled in. Various strategies were employed in this filling process, but most commonly rubble, dune sand, and all the other detritus of a rapidly expanding city were simply dumped into the bay. In other parts of the city, sand dunes were topped and used as a base to support new streets. The area now known as South of Market was once ". . . covered with immense sand dunes rising in height to more than 80 ft. . . . [in] the 1850s and 1860s, much effort was expended to level these dunes to make a flat easily drained building surface" (Pastron, et al. 1981:69).

In addition to rock, sand, and rubble, Yerba Buena Cove and Mission Bay were filled with commercial and household refuse as well. Broken, outdated, and worn-out household items ranging from chamber pots to tiny porcelain dolls were dumped into the landfill. Structural

features such as wharves, sidewalks, and wood pilings were frequently incorporated into the fill material (Pastron, et al. 1981:74-79; William Self Associates 1996).

The population explosion of Gold Rush-era San Francisco created an unprecedented demand for buildings, structures, homes, and warehouses. One of the quickest ways to acquire a "building" was to dismast a ship and relocate it in the shallow waters of the bay. These "buildings" were particularly useful as hotels, restaurants and warehouses. As the fill material created new land for the City of San Francisco, it frequently surrounded these floating "buildings", and made them landlocked. They were gradually incorporated into the bay fill and eventually entombed beneath the city streets. As discussed above, two Gold Rush-era ships, the *Othello* and the *Rome*, had been identified as potentially lying in the project alignment. The *Alta California* newspaper of January 5, 1852 contains a notice regarding the improper moorage of the *Othello* near what is now Steuart and Market Streets, and threatened action on the part of the harbormaster if the ship was not moved. Unlike the abandoned *Rome*, the *Othello* was a working storeship and, as it is not mentioned again in the historic literature, it is probable that it was moved from its moorage either by its owner or the harbormaster. This suggests that the hull encountered in the tunnel was that of the Gold Rush-era ship *Rome*, a vessel intentionally scuttled at the corner of Market and East Streets (now The Embarcadero) by Captain Fred Lawson in 1852.

In 1847, and again in 1850, Yerba Buena Cove was surveyed and subdivided into "water lots" which were subsequently sold at public auctions in 1847, 1850, and 1852 (Dow 1967). The city extended its streets into the waters of the cove by leasing its submerged lands to private individuals who built wharves across the cove and extended commercial enterprise into the deeper anchorages of the bay (William Self Associates 1996:7-9). Cross-connecting piers or streets on piles were built between the wharves, and the owners of the enclosed water lots subsequently filled their holdings with sand, rubble, and whatever other materials they could conveniently obtain. Abandoned ships were sometimes scuttled to establish property rights and demonstrate title to water lots. Of particular relevance to this report are the activities of Captain Fred Lawson, who scuttled numerous ships specifically for this purpose. Lawson's actions account for several of the Gold Rush-era ship hulks that reside in the fill beneath today's San Francisco streets.

In the early 1850s, Lawson purchased prime San Francisco water lots from Dr. Peter Smith for the extraordinarily low price of $3,500 per block. In comparison, adjacent blocks were appraised for a half-million dollars or more in 1853. This extreme price differential resulted from the

uncertainty of Smith's title, which was disputed by the City of San Francisco. Believing that possession was nine tenths of the law, Lawson gambled that the clarification of title would be in Dr. Smith's favor and purchased the lots from him, recognizing their future potential. Lawson's plan for establishing possession was fairly simple -- he purchased abandoned ships moored in Yerba Buena Cove and sank them as "improvements" on his lots, thus establishing a legitimate title. Lawson's gamble paid off when the Supreme Court of California ruled in favor of Smith's original title. Consequently all of the waterfront properties Lawson had purchased from Smith were legally his (Olmsted, et al. 1977:447-449; Pastron, et al. 1981:69).

In the *San Francisco Examiner* of August 31, 1890, Lawson recounted the story of how, when, and where he scuttled several abandoned ships in the shallows of San Francisco Bay. In his story, Lawson described the 1852 sinking of the ship *Rome*, one of the historic ships identified in the project FEIS as possibly lying in the MMTP alignment:

> The ship *Rome* was a big Russian hulk that cost me about $1,000. She was used for a coal ship and sunk by me at the southwest corner of Market and East (now Embarcadero) streets, under where the Ensign saloon was. Her bow touches the edge of Market street. I sank her for Joseph Galloway, and I had to do it in a hurry. Galloway bought a block of Smith [sic]. One morning he came running up to me and excitedly asked if I had a ship. I told him yes, that I had the *Rome*. He told me an injunction was to be served to prevent him having any more piles driven, but that if he could have the ship scuttled before 1 o'clock he would be all right. Before 1 o'clock my tow-boat took the *Rome* in to where he wanted it and *down she went* [emphasis added]. I got $5,000 for that job (*San Francisco Examiner* 1890).

As might be expected in relating a story some thirty-eight years after the fact, Lawson's account of the sinking of the *Rome* contains a few minor factual errors. For example, the ship was not a "Russian hulk". Historic records of the *Rome* show that it was built in Salem, Massachusetts in 1829 (Fairburn 1897:3018). Lawson's recollection that the *Rome* was sunk, ". . . at the southwest corner of Market and East Streets, under where the Ensign saloon was . . ." is questionable and more than likely inaccurate, as determined by Olmsted, Olmsted and Pastron (1977:287-291). Through careful examination of historic documents, maps, photographs, and line drawings, these researchers ascertained that if the *Rome* was sunk where Lawson says it was, it would have been ". . . lying right at the head of the slip alongside the Market Street wharf, where she would have been an obstruction" (Olmsted et al. 1977:288). Lawson's reference to the *Rome* being sunk ". . . where the Ensign saloon was" also contradicts his statement that it was on the southwest corner of Market and East Streets. An 1894 line drawing depicting the south side of

Market Street clearly shows the Ensign saloon on the southeast corner of Market and East Streets, rather than on the southwest corner (Figure 10). Finally, as discussed below, examination of the hull's orientation indicated that the stern of the ship, and not the bow, would have been touching Market Street when the *Rome* was scuttled. Despite these minor discrepancies, Lawson's recollection that the *Rome* was sunk at the corner of Market and East Streets coincides exactly with the location of the ship encountered in the tunnel and provides compelling testimony as to its identification; the physical remains are also consistent with those of a ship the size of the *Rome*.

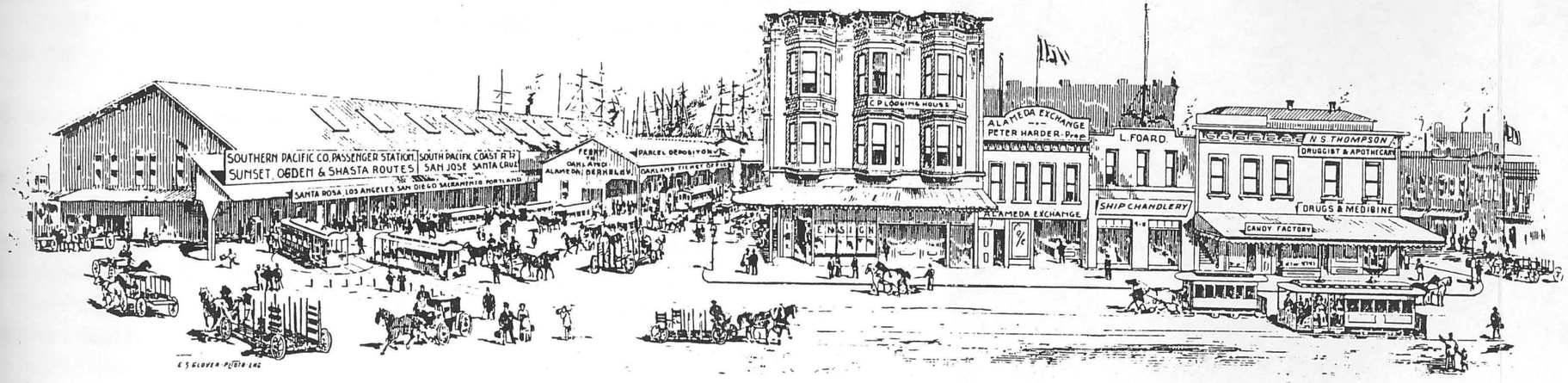
4.0 HISTORIC BACKGROUND OF *ROME*

The *Rome* was a three-masted ship built in 1829 by Elijah Briggs in the Salem Massachusetts shipyard of his cousin, Enos Briggs. It was registered as 344.5 tons at Salem on October 13, 1829, Pickering Dodge owner and Samuel Kennedy, master. Salem, although not noted as a shipbuilding center, is credited with construction of some of the earliest ships of the eastern United States, and by the end of the seventeenth century was an important port in the West Indian trade (Fairburn 1897:2979). Salem remained an important trading port through the early 19th century, but following the War of 1812, other ports such as New York, Boston, and Philadelphia surpassed Salem in registered tonnage. Salem tried to maintain its status as a primary port for the next several decades but the combined disadvantages of a shallow water harbor and no convenient overland rail access forced the port of Salem into decline and led to its ultimate demise. Fairburn notes that Salem:

> . . . as a port survived for years in competition with Boston and other New England and U.S.A. ports because of the outstanding quality of Salem merchants, shipmasters, and seamen. Because of the initiative, courage, and competency of its men engaged in the operation of ships, Salem, for about a couple of decades, was America's greatest foreign trade port and, considering size and population, led the world (1897:3027).

From the time of the earliest Puritan settlers, some smaller ships were built in Salem, but ". . . at no time, however, was Salem a great shipbuilding center, and nature never intended Salem to build large ships or to construct and launch even moderate-sized or small ships in numbers" (Fairburn 1897:3027). Early shipwrights employed in the bustling trade port of Salem worked on repairing and reconditioning ships rather than building new ones. This is not to suggest that ship construction was not important in Salem. Primarily in the eighteenth century and the early

MARKET ST., SAN FRANCISCO, FROM WATER FRONT TO SECOND ST.



Ferry Bldg 1 7 9–11 17

S. P. Passenger Station and Ferry Lines — East St. — Market St.—South Side — Steuart St.

FERRY PARCEL DEPOSITORY, Ferry B'ldg
Foster & Orear, Proprietors
General News Depot, etc.

1 **Market Street. ENSIGN SALOON,**
C. Schwartz, R. Rusing, A. Mayer, Props.

5. **THE C. P. LODGING HOUSE,**
N. B. Thayer, Proprietor

7. **"ALAMEDA CAFE,"** Coffee and Lunch
Jacob Peterson, Proprietor

7. **"ALAMEDA EXCHANGE"** Saloon,
Peter Harder, Proprietor

9–11. **L. FOARD,** Ship Chandler and Naval Stores

17. **MARINE DRUG STORE,**
N. S. Thompson, Druggist

Source: Illustrated Directory 1895

Figure 10
View of Ferry Terminal Area
1895

MUNI METRO TURNBACK PROJECT
SAN FRANCISCO, CALIFORNIA

William Self Associates
March 1996

decades of the nineteenth century, Salem shipbuilders constructed sturdy vessels credited with being the first American ships to travel to ". . . Japan, India, the Philippines, Guam, the Cape of Good Hope, Sumatra, Arabia, and the South Seas" (Fairburn 1897:2980). The *Rome* itself made several voyages as an active participant in this trade, including a voyage to Calcutta in 1830, Batavia and Manila in 1838, Manila again in 1839, and San Francisco in 1849 (Logbooks of the *Rome* 1830, 1838, 1839; *Alta California* 1852).

On October 21, 1834, the *Rome* was registered again at Salem with an ownership comprising John T. Allen, George W. Jenks, Horace H. Jenks, Pickering Dodge, and Horace H. Jenks, master; this suggests that Pickering Dodge, no longer the sole owner, had entered into a trading partnership with these merchants. This association comprised the investors in the *Rome*'s 1838 trading voyages to Batavia and Manila and the 1839 trading voyage to Manila. The *Rome* was subsequently acquired by the firm of Silsbees, Stones, Pickmans, Sanders and Allen, who registered the vessel in Salem on January 23, 1843. Owners were Benjamin H. Silsbee, Benjamin W. Stone, William Stone, William D. Pickman, John H. Silsbee, and Nathanial Brown; Thomas Dean, master.

4.1 Salem Shipowners Association

One of the most notable firms involved in Salem's foreign trade was the association of Silsbees, Stones, Pickmans, Sanders, and Allen, who operated in that city from 1798 to 1898. This loosely organized group of merchants acquired and managed ships, and bought and sold the cargoes that their ships carried. The firm's century of success was predicated on a strategy of buying a product when the market price was low and selling only when they could net a profit. At times, products would be warehoused for years until the price had escalated enough to ensure a profit the firm thought reasonable. Over the years, the firm owned at least twenty-six vessels, but only six of them were built in Salem, all between the years 1818 and 1840 (Fairburn 1897:3017-3021). It was this firm that owned the *Rome* on her final voyage to San Francisco.

4.2 Construction of the *Rome*

Despite the historic perception that shipbuilding in colonial Salem, Massachusetts was inconsequential, in the sixty year period between 1783 and 1843 in excess of 230 ships, brigs, barks, brigantines, and schooners were built in 4 major and several smaller shipyards in the Salem area. Total tonnage of the Salem ships built during this period exceeded 40,000 tons, with

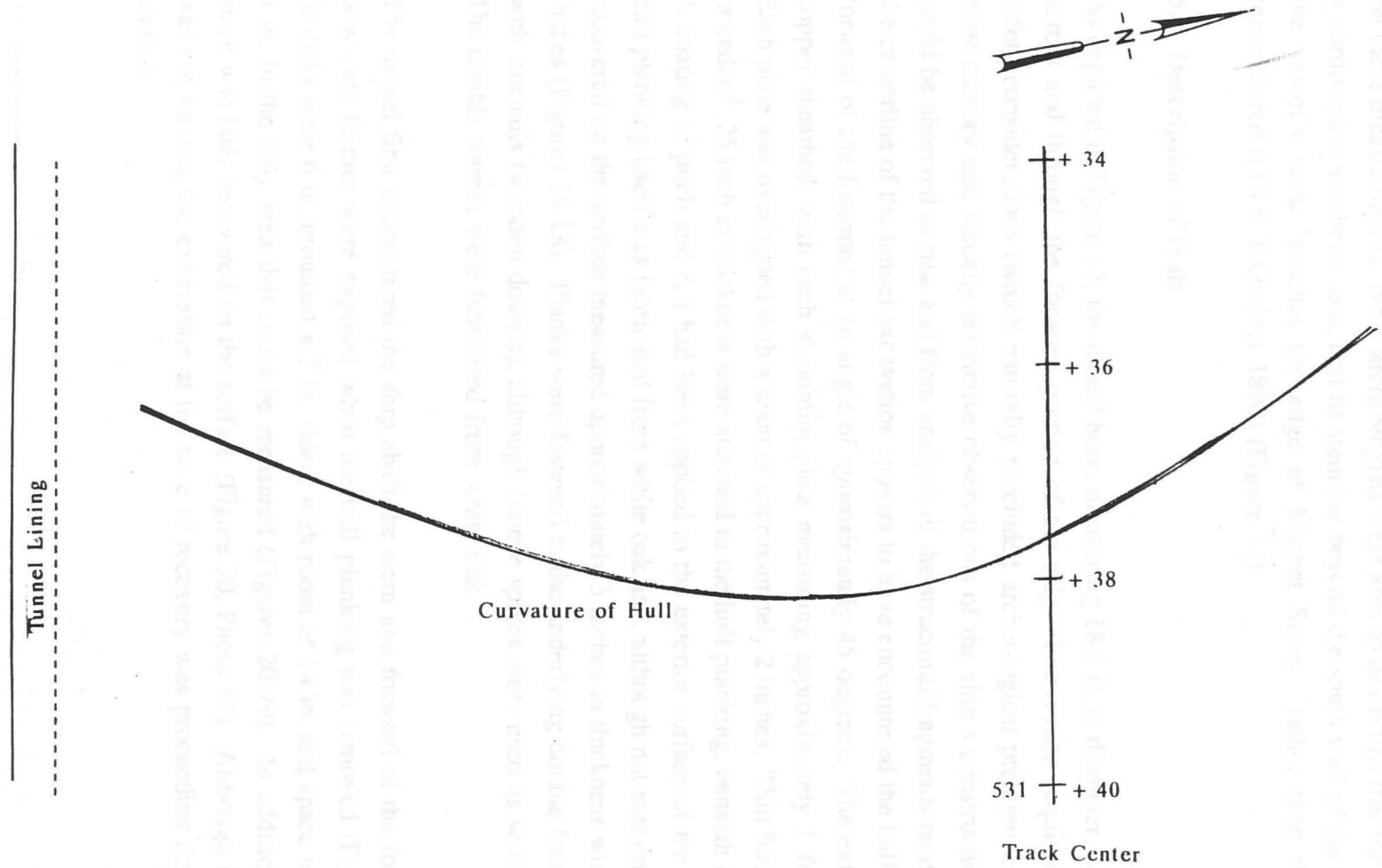
vessel sizes averaging approximately 217 tons. The most prominent Salem shipbuilder of the late 18th and early 19th century was Enos Briggs, who built at least 52 vessels, averaging 233 tons, in the 27 year period from 1790 to 1817. On Briggs' death in 1817, his cousin Elijah Briggs assumed control of the yard and in the eight year period from 1817 to 1825, produced 12 vessels averaging approximately 300 tons (Fairburn 1897).

Among the vessels produced by Enos Briggs was the 344.5 ton, three-masted ship *Rome*, which measured 116 ft. between perpendiculars, had a 25.7 ft. beam, and a 12.3 ft. depth of hold (John Frayler 1995, pers. comm.). Little is known of the ship's history beyond the trading voyages discussed above. The ship's final voyage, under Captain Josiah Dudley, was noted by Fairburn: "The ship *Rome* was sent around the Horn to San Francisco in the Gold Rush of 1849 and, following her arrival, was drawn upon the shore and built into a wharf" (1897:3019). An article in the *Pacific Marine Review* (September 1921), states that the *Rome,* an American ship of 344 tons, arrived in San Francisco on February 28, 1850. The March 1, 1850 edition of the *Alta California* confirms this, stating that the *Rome*, 210 days from New York, had arrived in San Francisco under Josiah Dudley (Stephen Canright 1994, pers. comm.). An ad in the March 5, 1850 edition of the *Alta California* details the assorted cargo offered for sale by the *Rome*. Some of the items comprising the *Rome*'s cargo included "40 barrels of dried apples, 100 dozen bottled ale, 100 dozen brown stout, 50 firkins butter, 25 barrels pea beans, 25 dozen white beans, 50 barrels of prime storehouse pork, re-salted, 100 barrels cement, 50 cots and 200 boxes window glass" (*Alta California* 1850).

5.0 Description of Physical Remains of the *Rome*

5.1 Ship Alignment

With the first exposure of the ship's hull on December 2, 1994, it was apparent from the lay of the overlapping seams of the copper sheathing that the vessel's bow lay on the south side of the tunnel, and the stern on the north side. The angle of the ship relative to the tunnel, and the position of the tunnel relative to the ship's longitudinal axis was impossible to determine at that point, since the exposure of the hull was limited to the 18.5 ft. diameter opening at the face of the tunnel shield. The curvature of the exposed hull was measured by the project's surveyors (Figure 11). Not until the foremast, keelson, and keel were exposed and surveyed on December 13, 1994, was it possible to determine the exact orientation and position of the ship relative to



Not to Scale

MUNI METRO TURNBACK PROJECT
SAN FRANCISCO, CALIFORNIA

William Self Associates
March 1996

Figure 11

Curvature of Hull
(Plan View)

the tunnel and, subsequently, its position relative to features at street level (Figure 12). Based on these measurements, WSA archeologists were able to determine that the ship was oriented on a northwest to southeast axis, that its stem lay beyond the south wall of the north tunnel, and that the vessel's stern "touches the edge of Market Street", rather than the bow, as Lawson remembered it (S.F. Examiner 1890) (Figure 13).

5.2 Description of Hull

As depicted in Figure 13, the tunnel bore, measuring 18.5 ft. in diameter, was driven at an angle across and through the forward portion of the ship. Excavation requirements and tunnelling safety considerations (which naturally precluded archeological preferences) limited all but the most cursory and visually restrictive observations of the ship's construction. From what little could be observed *in situ*, and from analysis of the structural fragments recovered on the surface, the centerline of the tunnel excavation appears to have encountered the hull approximately 16 ft. forward of the foremast at an angle of approximately 45 degrees. The exterior of the hull was copper sheathed, with each sheathing plate measuring approximately 1 ft. x 4 ft. (Photo 11). Each plate was overlapped with a seam of approximately 2 inches. Thin furring planks of juniper or cedar,[3] .25 inch in thickness were attached to the hull planking, beneath the copper sheathing. A coating of pitch and felt had been applied to the exterior surface of the furring planks. The hull planking itself was fabricated from white oak and, although not measured *in-situ*, fragments recovered on the surface measured approximately 3 inches in thickness with widths of 12 to 14 inches (Figures 14-18). Planks were fastened to the underlying double framesets predominately with treenails (wooden dowels), although bronze spikes were used as well (Photos 12, 13, 14). The double frames were fabricated from white oak.

The tunnel first encountered the ship abaft the stem and forward of the foremast, so the ship's bow cant frames were exposed when the hull planking was removed (Figure 19). Measured futtocks were 6 in. moulded x 7 in. sided, with room of 14 in. and space of approximately 2 to 3 in. in the only area that could be measured (Figures 20-29). In addition, a chock or filling piece was later recovered on the surface (Figure 30, Photo 15). Although its exact provenience was not known, the excavation at the time of recovery was proceeding through the lower bow section.

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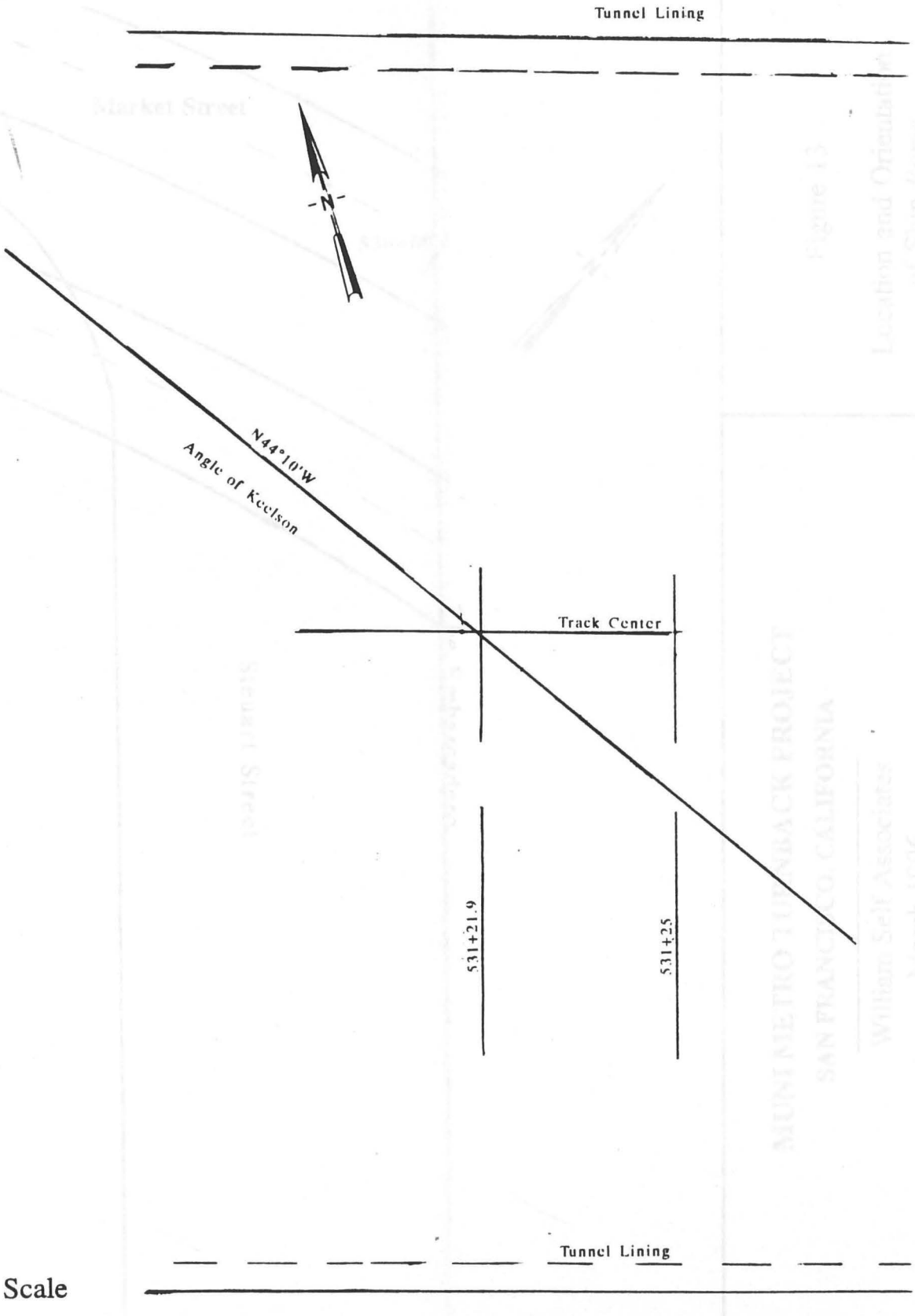
[3] The wood types of various structural members are summarized in Table 1, *Wood Types of Hull Components.*

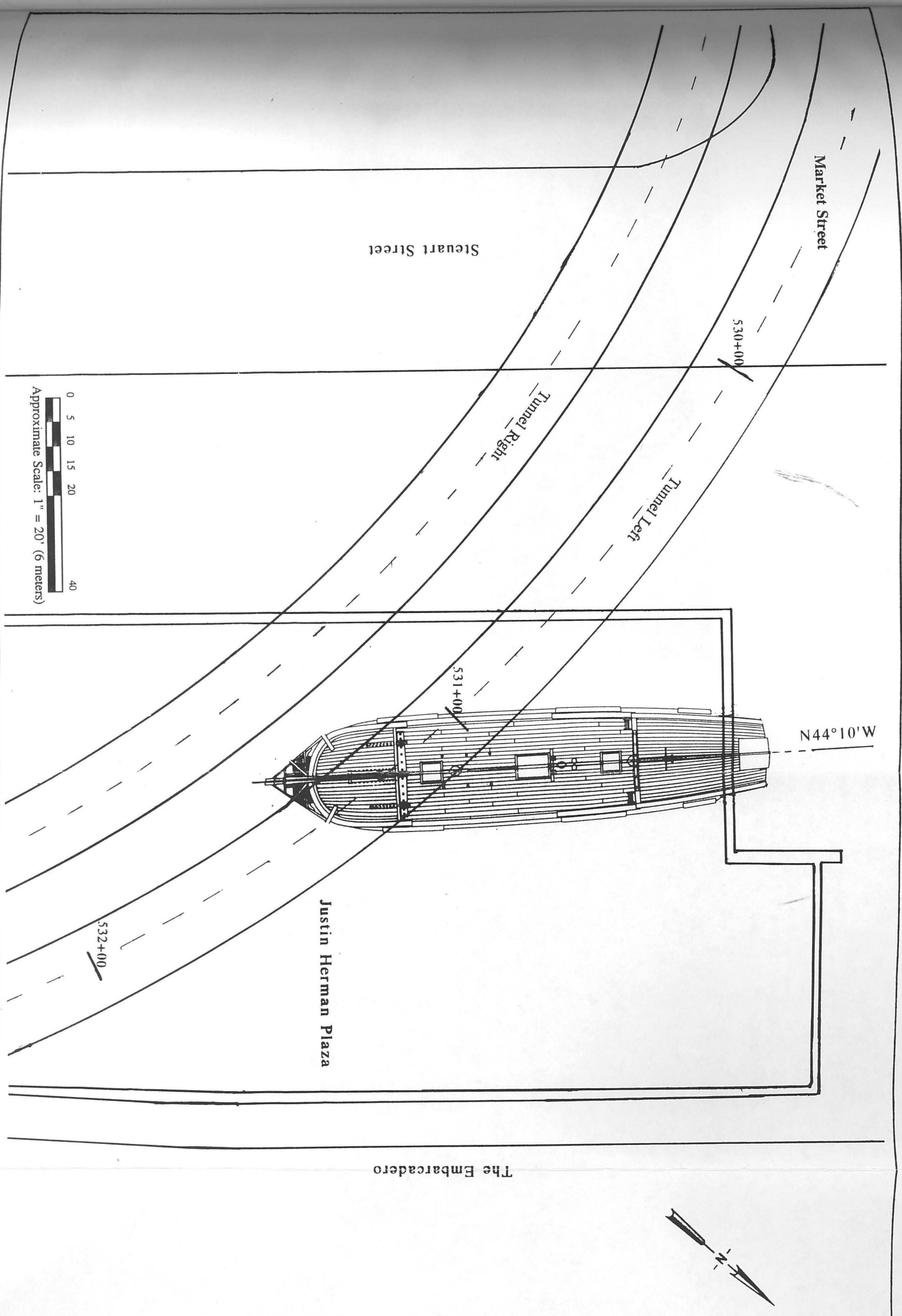


Not to Scale

MUNI METRO TURNBACK PROJECT
SAN FRANCISCO, CALIFORNIA
March 1996

Figure 12

Angle of Keelson
across Tunnel



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SAN FRANCISCO, CALIFORNIA

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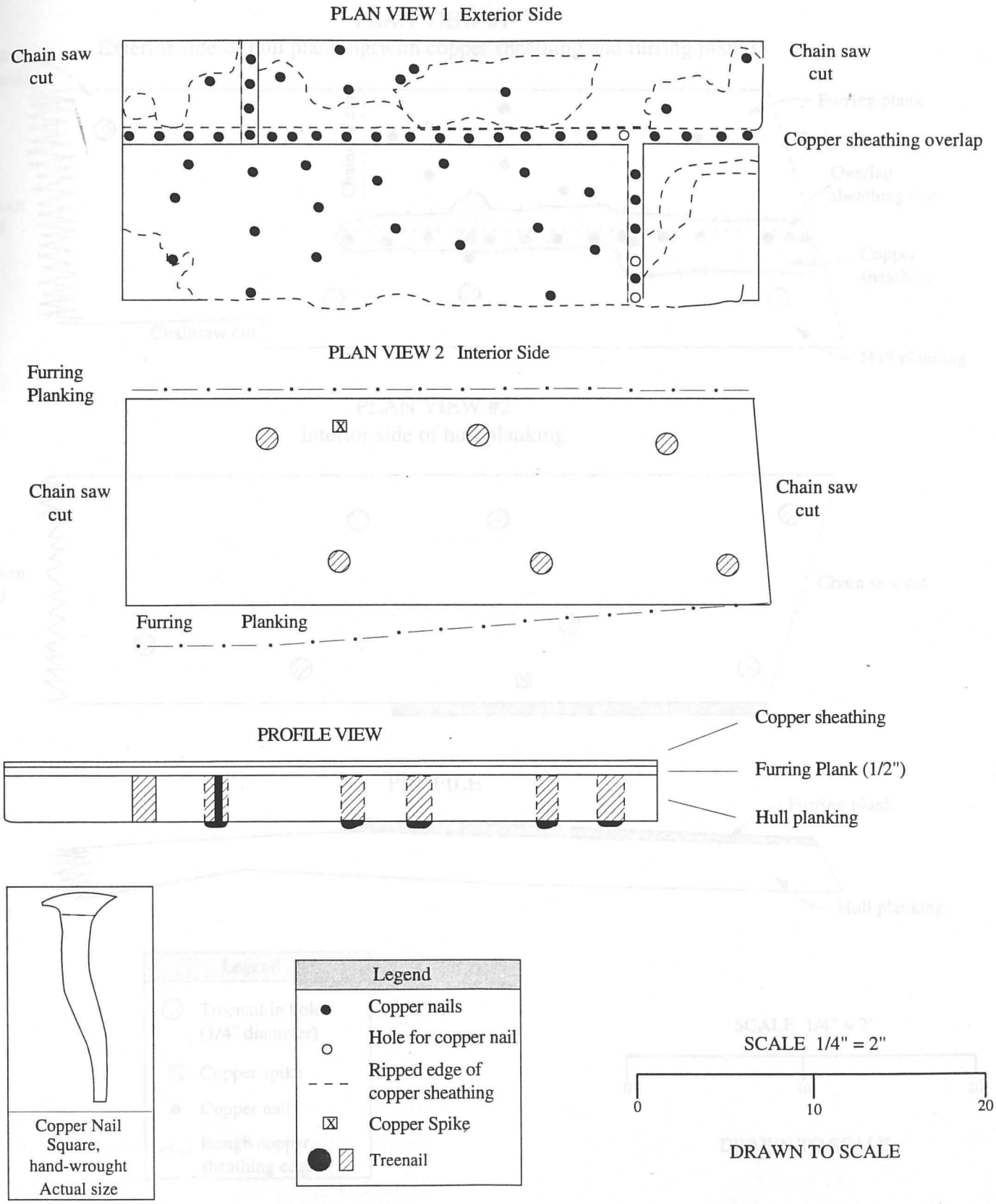
March 1996

Figure 13

Location and Orientation
of Ship *Rome*

(Plan View of Hull after MacGregor 1985)

Photo 11 Copper sheathing

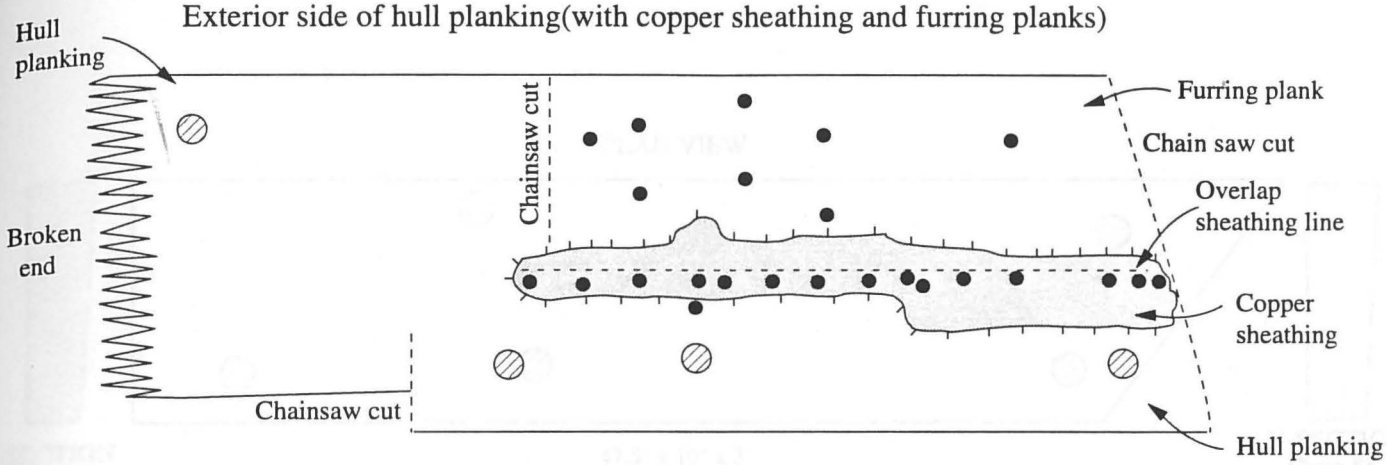


MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

Figure 14
Hull Planking with Furring Plank and Copper Sheathing

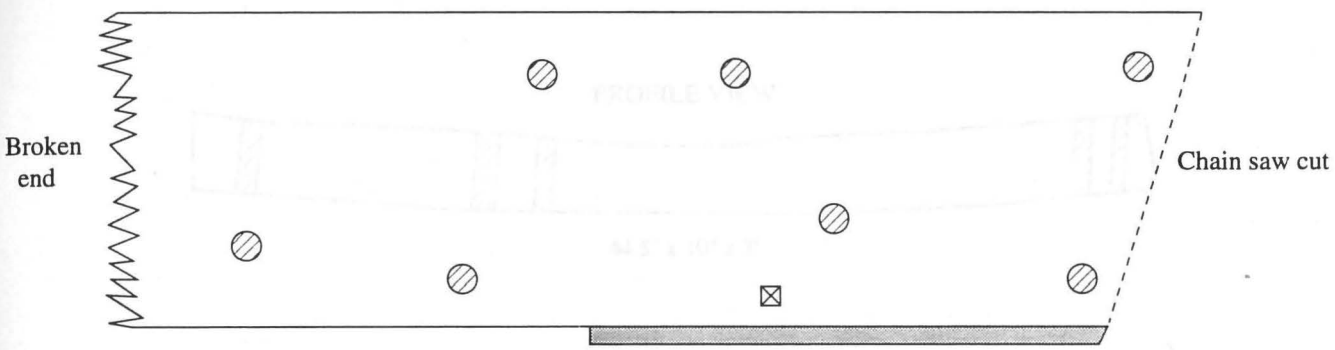
PLAN VIEW #1

Exterior side of hull planking(with copper sheathing and furring planks)

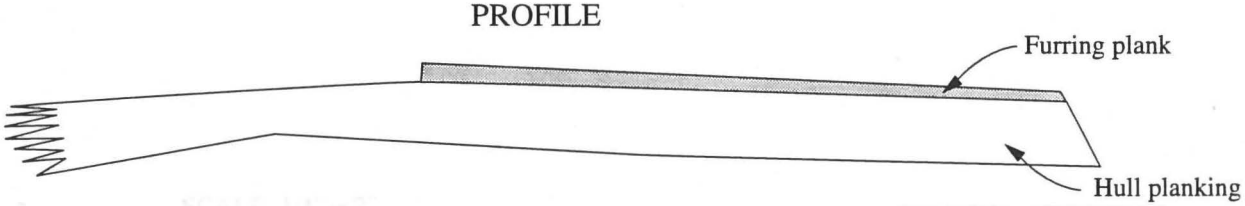


PLAN VIEW #2

Interior side of hull planking



PROFILE



Legend
Treenail in hole (1/4" diameter)
Copper spike
Copper nail
Rough copper sheathing edge

SCALE 1/4" = 2"

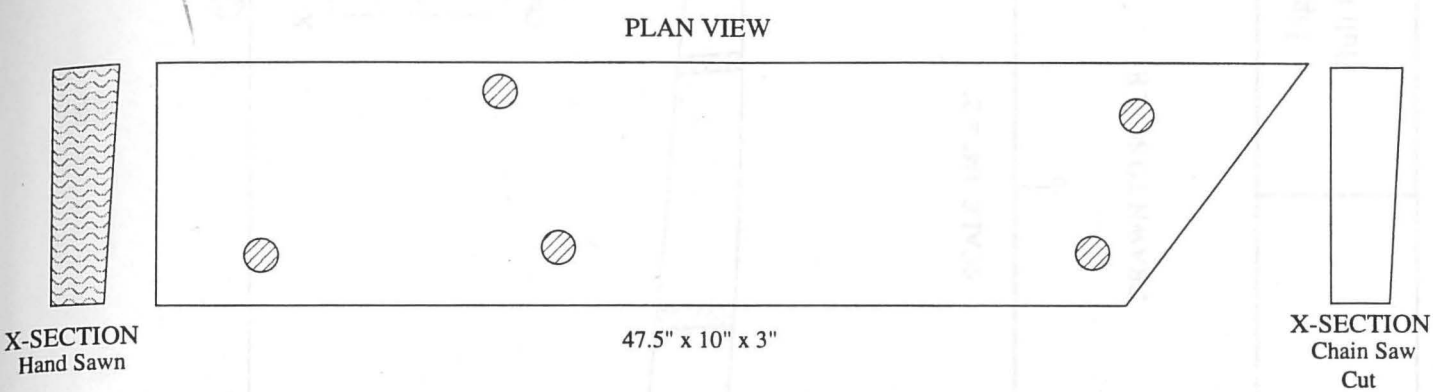
0 10 20

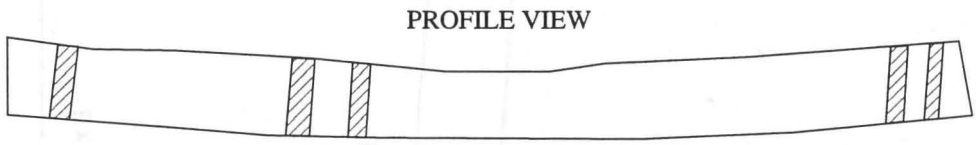
DRAWN TO SCALE

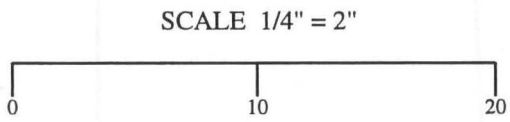
MUNI METRO TURNBACK PROJECT

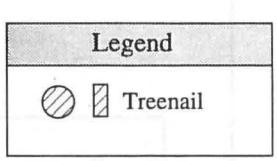
Documented Remains of Ship *Rome*

Figure 15
Hull Planking with Copper Sheathing and Furring Plank







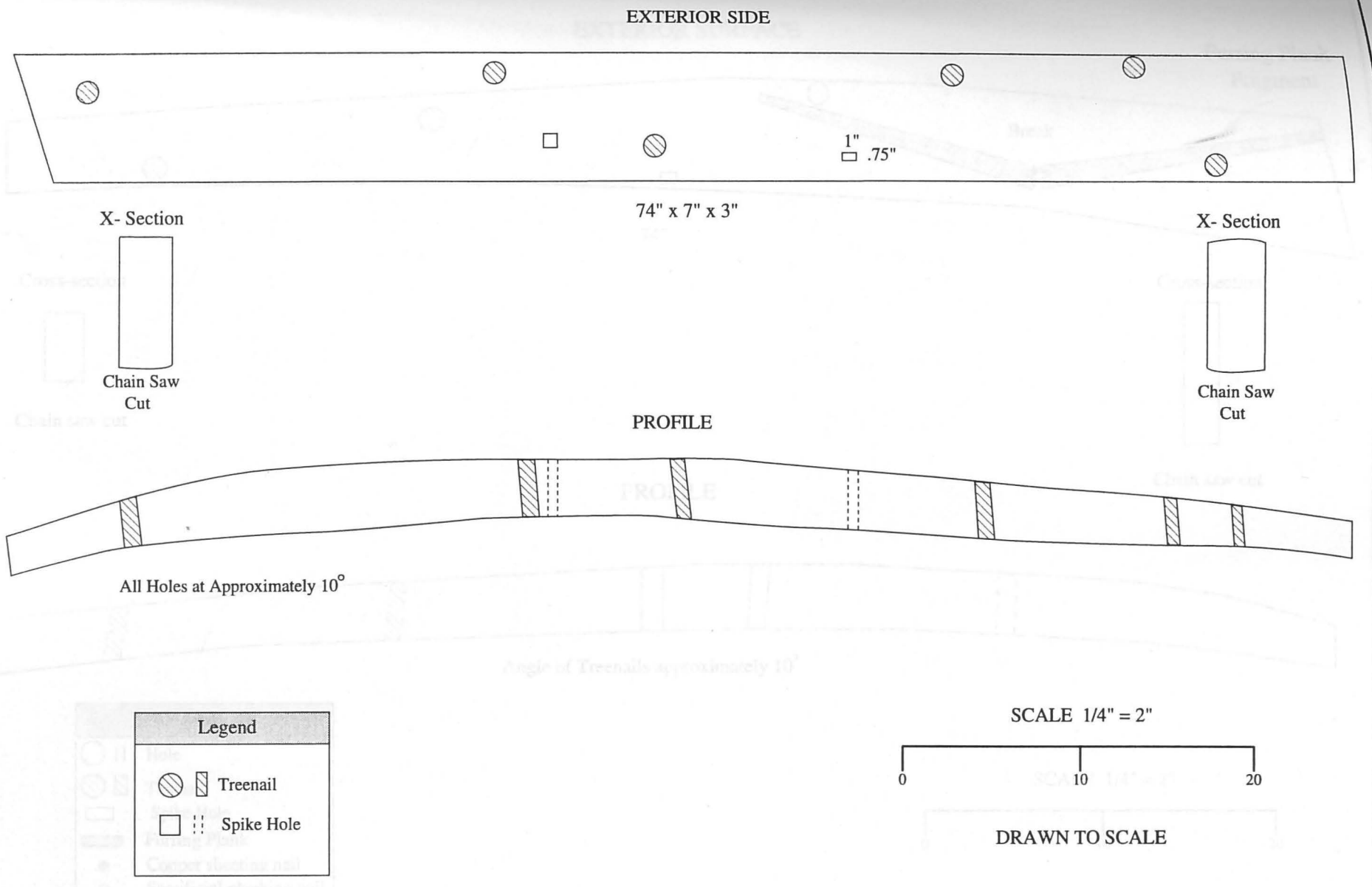


MUNI METRO TURNBACK PROJECT

Documented Remains of Ship *Rome*

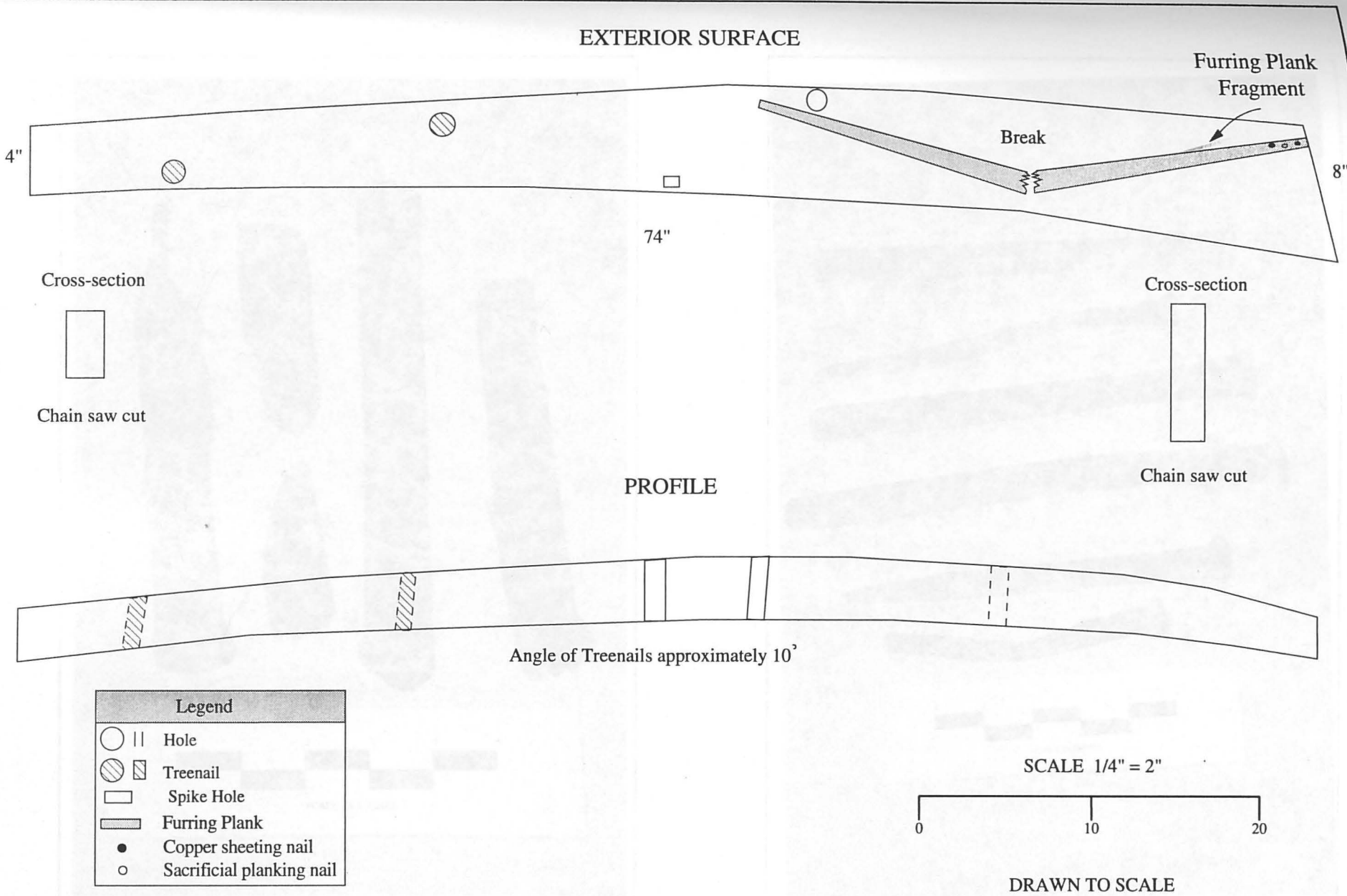
Figure 16

Hull Planking



MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

Figure 17
Hull Planking



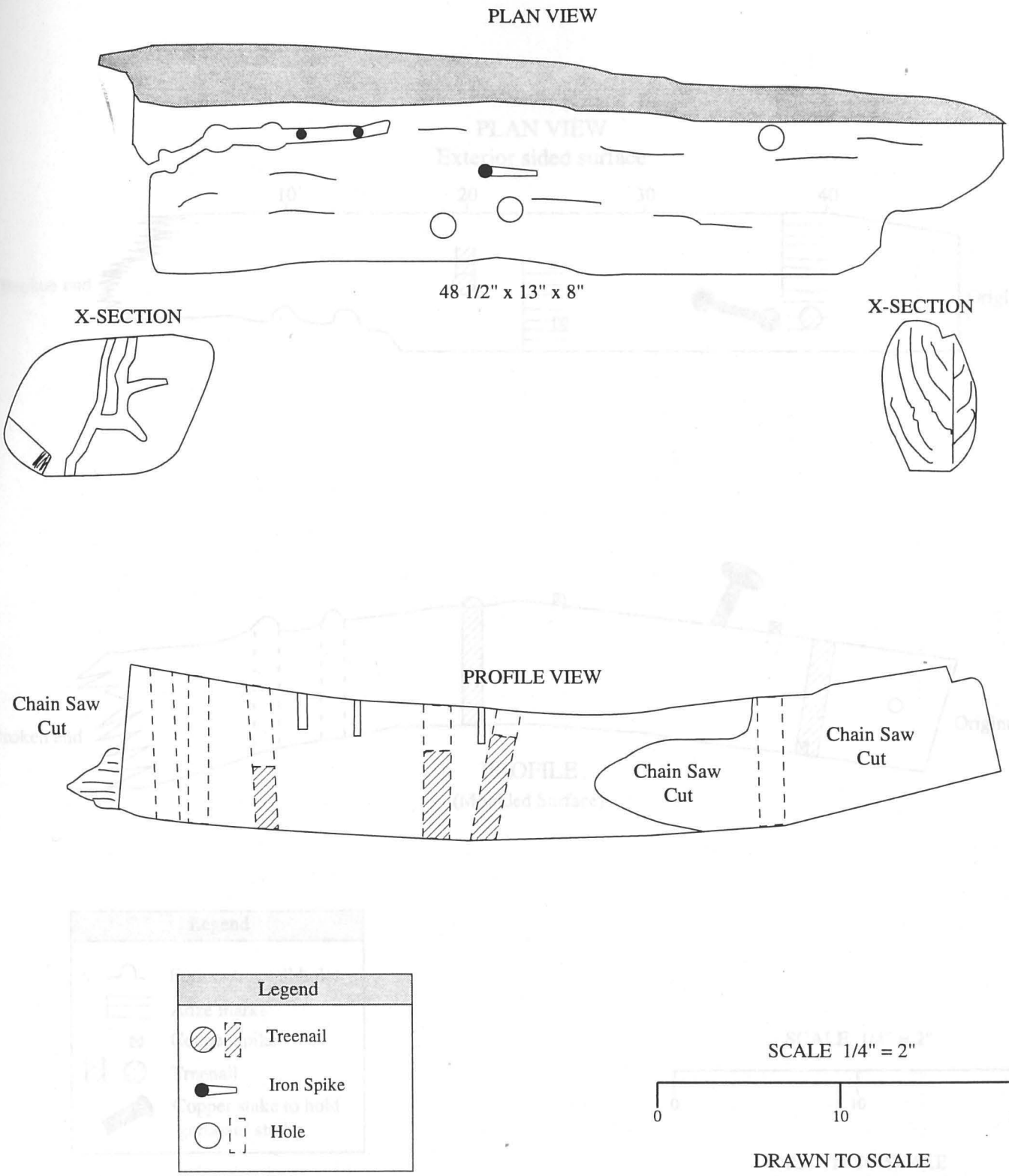
MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

Figure 18
Hull Planking

Photo 12 Treenails and degraded iron fastener

Photo 13 Bronze fasteners

Photo 14 Bronze drift bolt

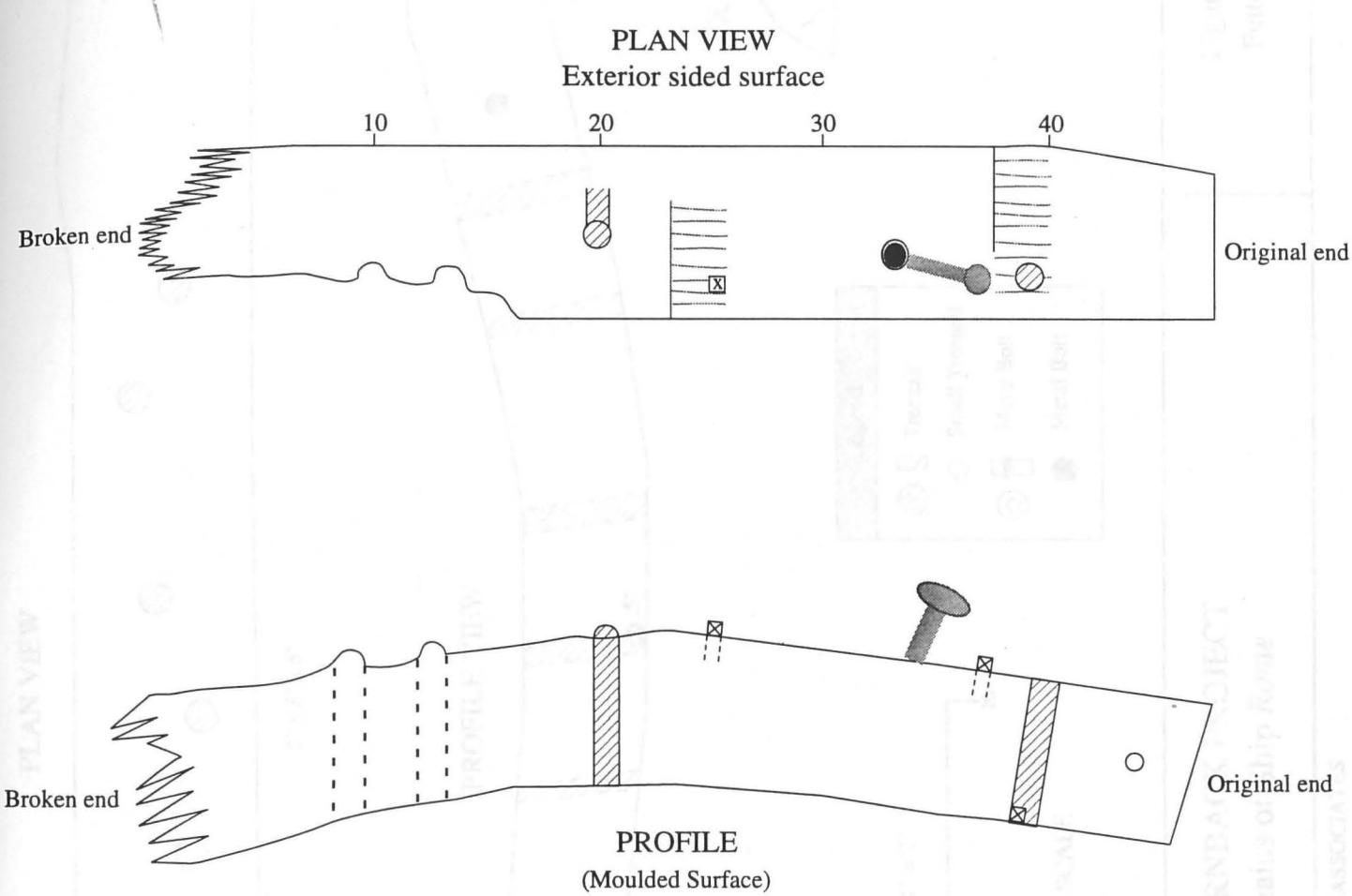


MUNI METRO TURNBACK PROJECT

Documented Remains of Ship *Rome*

Figure 19

Futtock

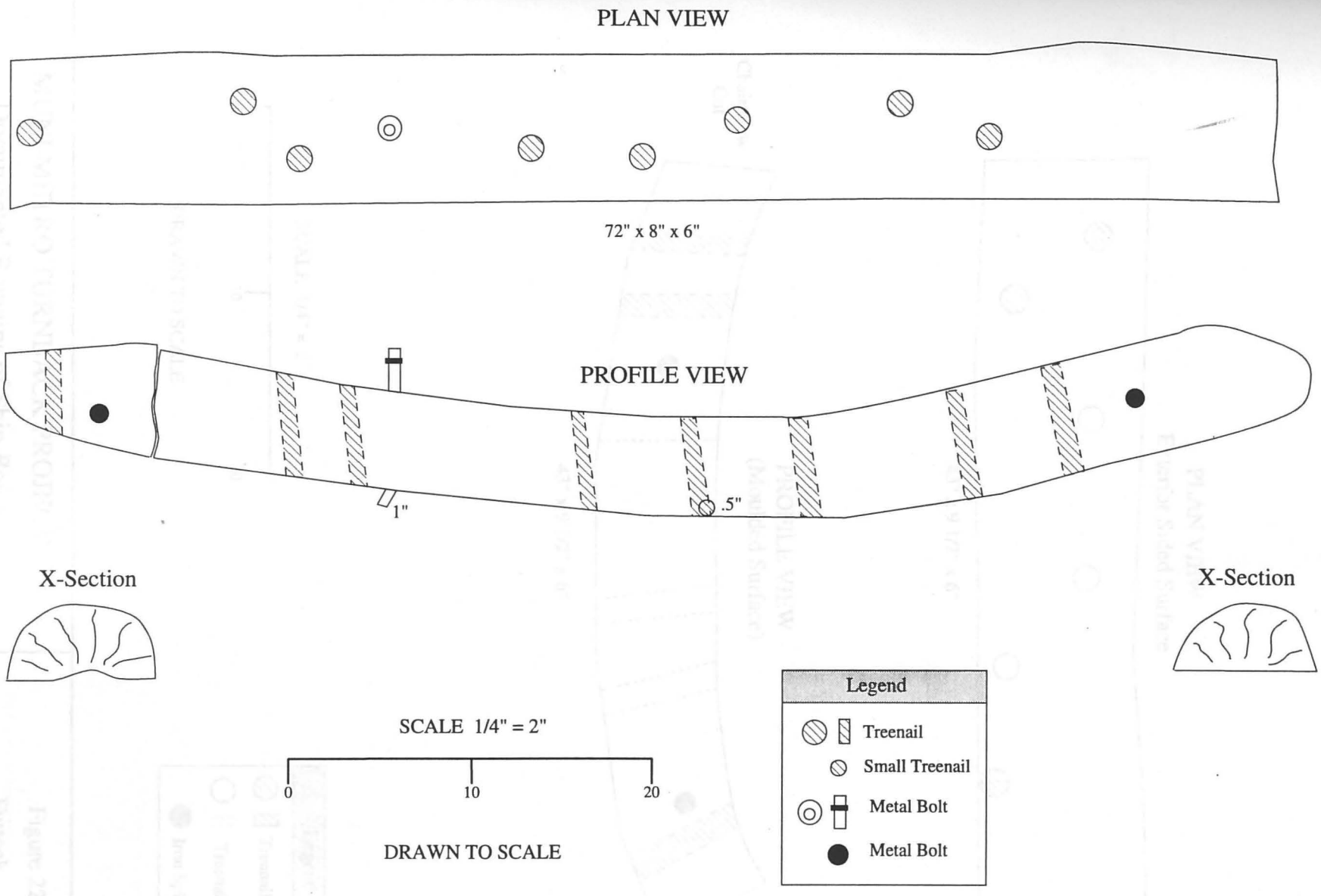


MUNI METRO TURNBACK PROJECT

Documented Remains of Ship *Rome*

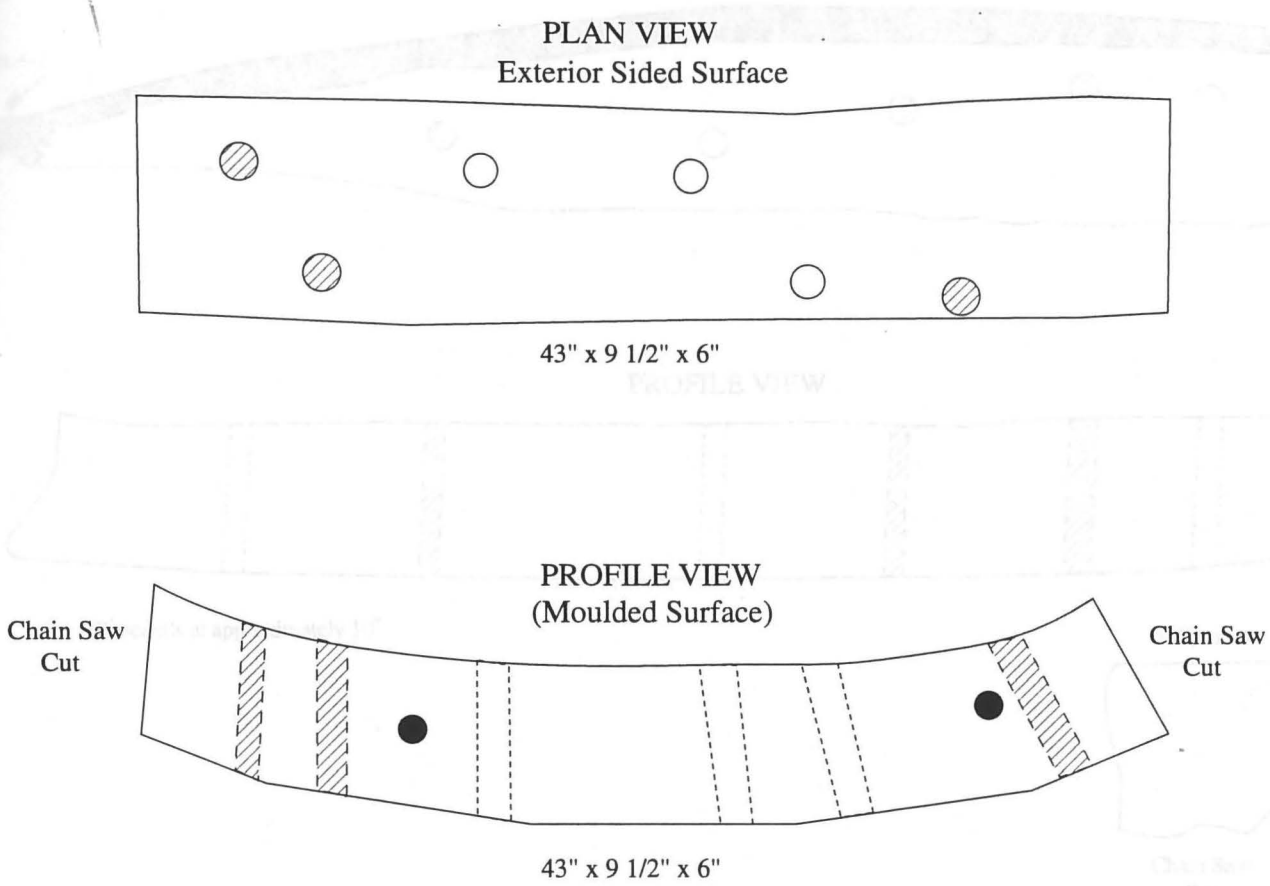
Figure 20

Futtock

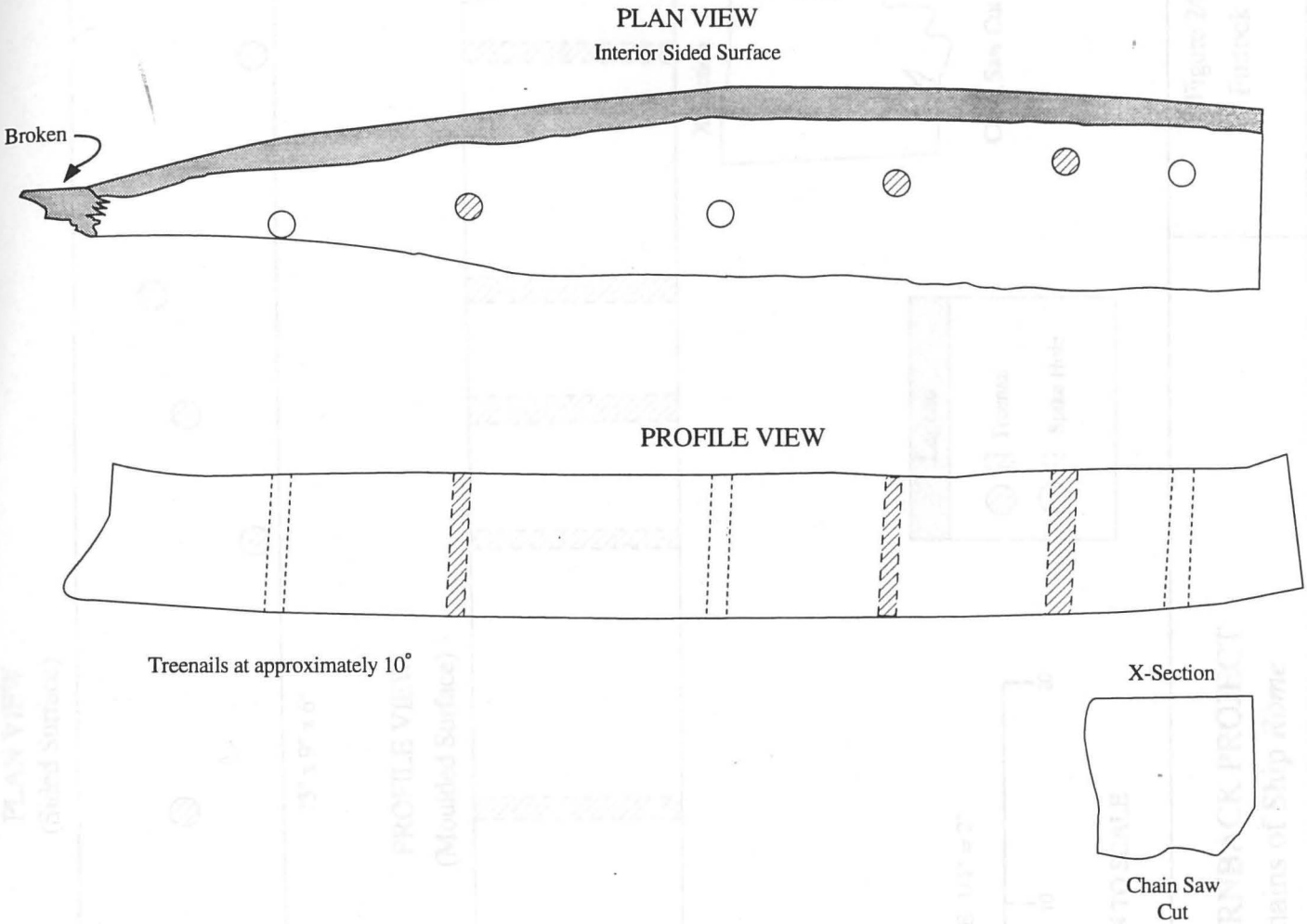


MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

Figure 21
Futtock



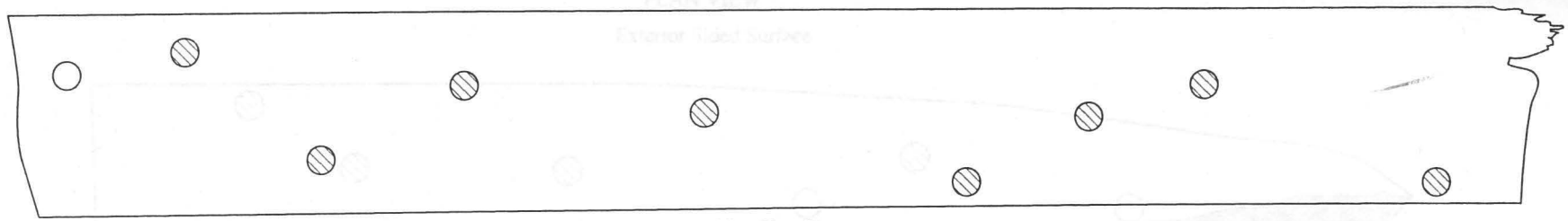
MUNI METRO TURNBACK PROJECT Documented Remains of Ship *Rome*	Figure 22 Futtock



MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

Figure 23
Futtock

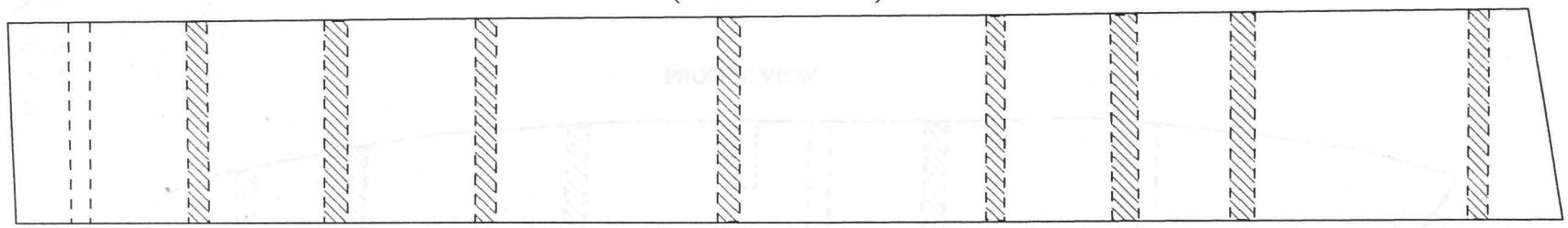
PLAN VIEW
(Sided Surface)



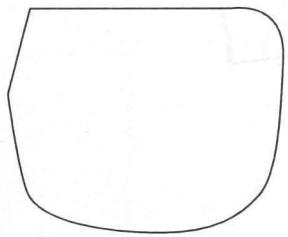
73" x 9" x 6"

PROFILE VIEW
(Moulded Surface)

Treenails are 90° to the frame

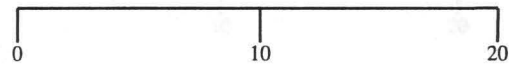


X-Section



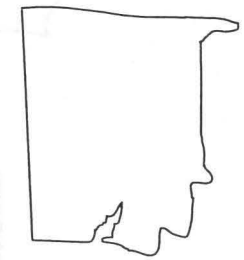
Chain Saw Cut

SCALE 1/4" = 2"

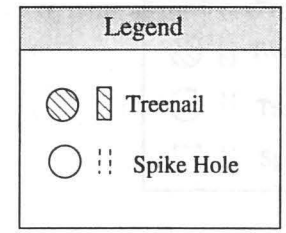


DRAWN TO SCALE

X-Section



Chain Saw Cut

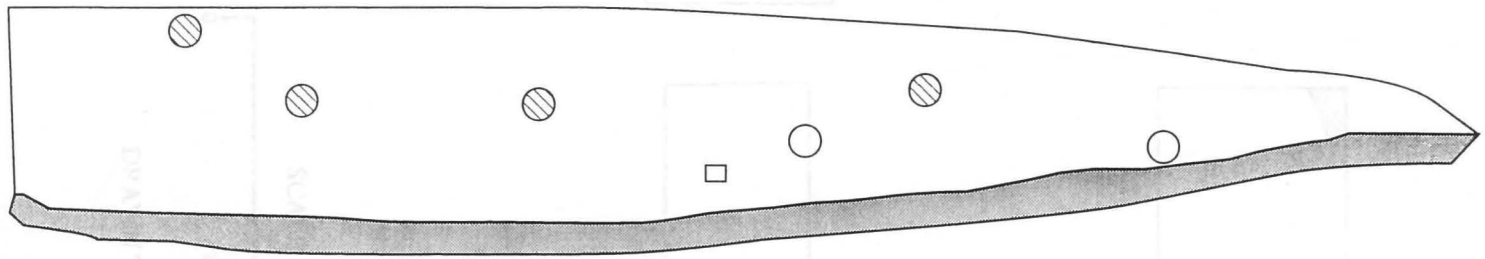


MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

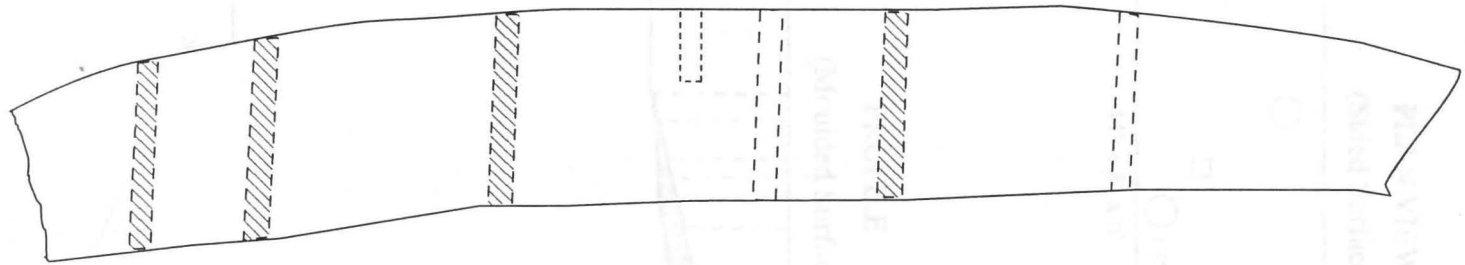
Figure 24
Futtock

PLAN VIEW

Exterior Sided Surface



PROFILE VIEW



SCALE 1/4" = 2"

0 10 20

DRAWN TO SCALE

Legend	
Treenail	
Treenail Hole	
Spike Hole	

MUNI METRO TURNBACK PROJECT

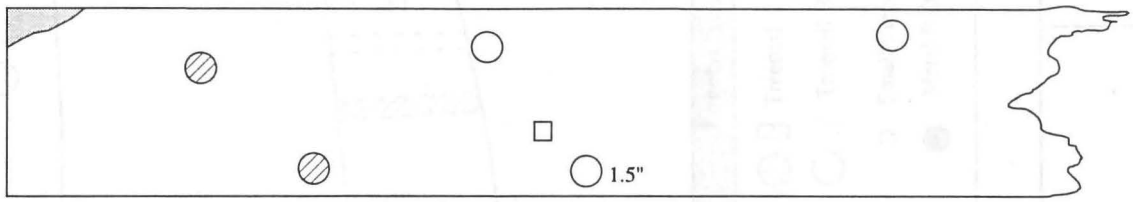
Documented Remains of Ship *Rome*

Figure 25

Futtock

PLAN VIEW

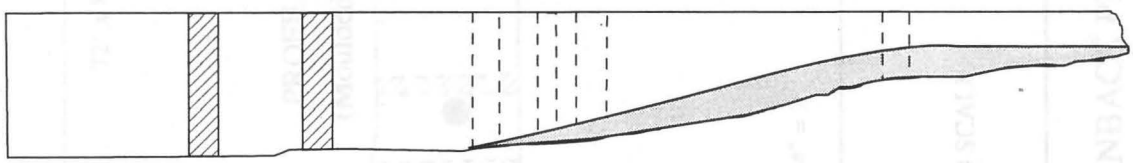
(Sided Surface)



44" x 8" x 6"

PROFILE

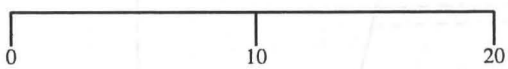
(Moulded Surface)



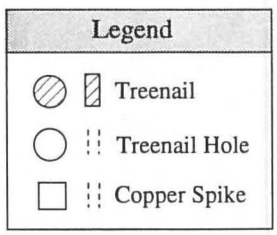
X-Section

Chain Saw Cut

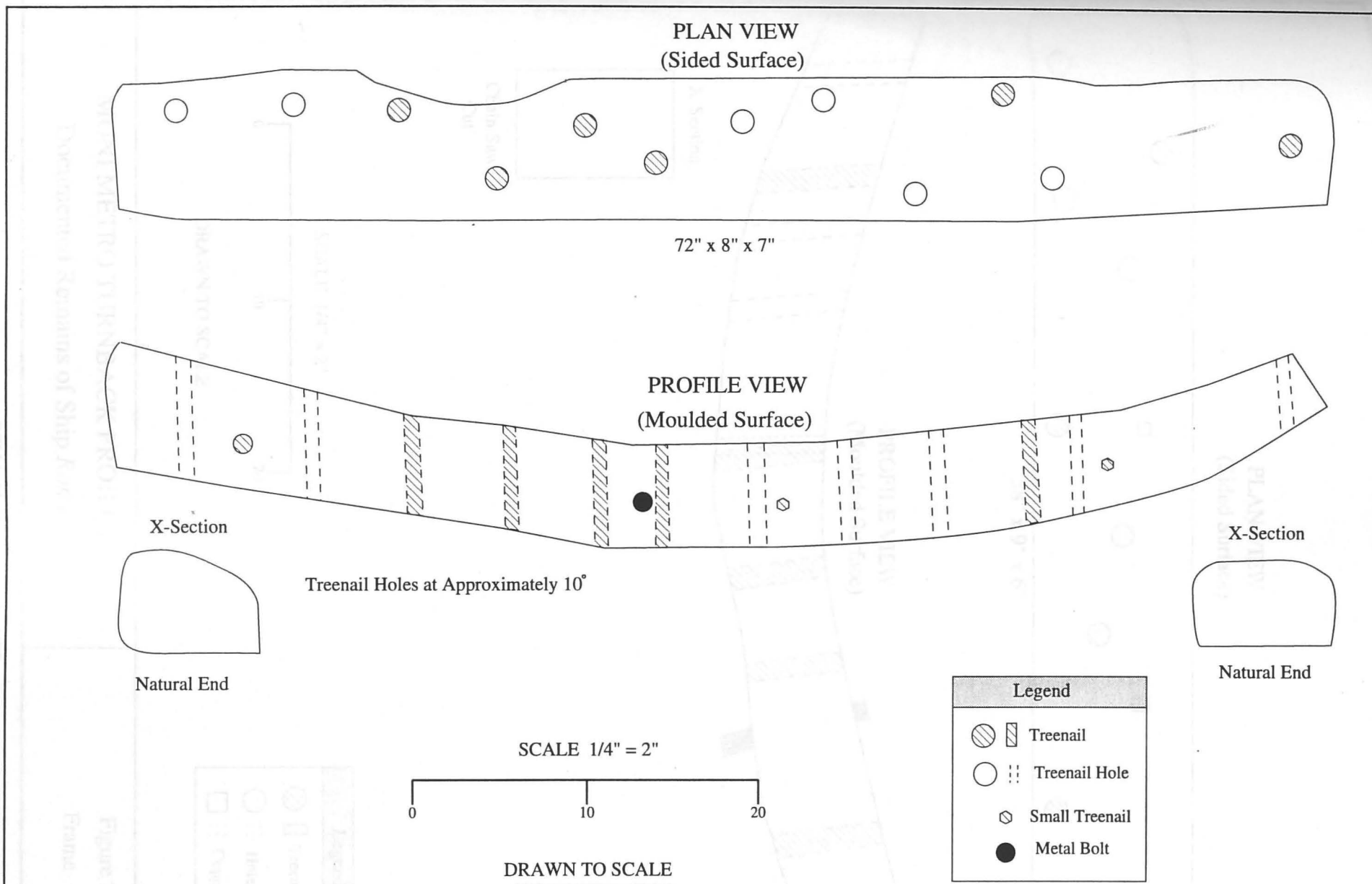
SCALE 1/4" = 2"



DRAWN TO SCALE

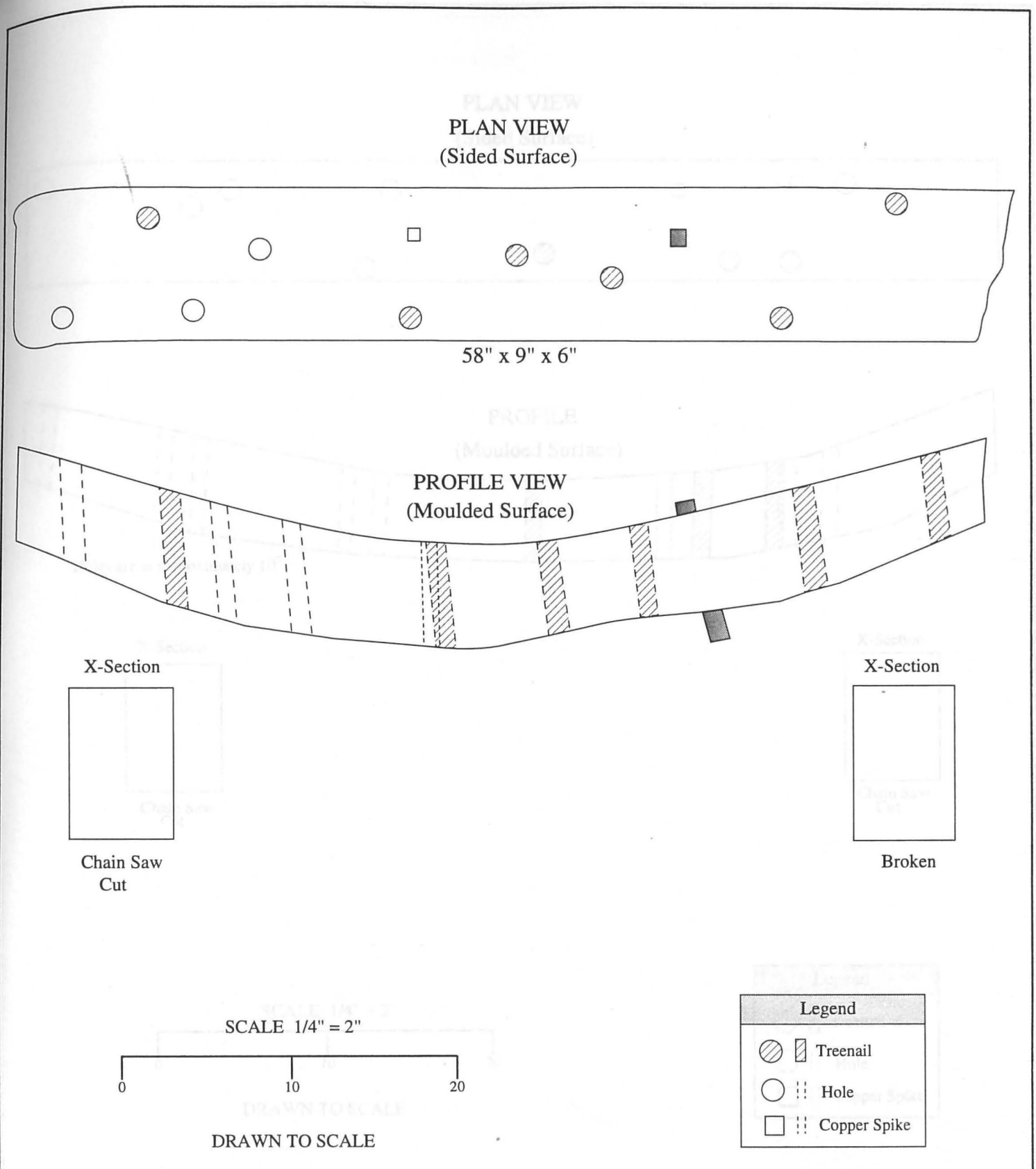


MUNI METRO TURNBACK PROJECT Documented Remains of Ship *Rome*	Figure 26 Futtock



MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

Figure 27
Frame

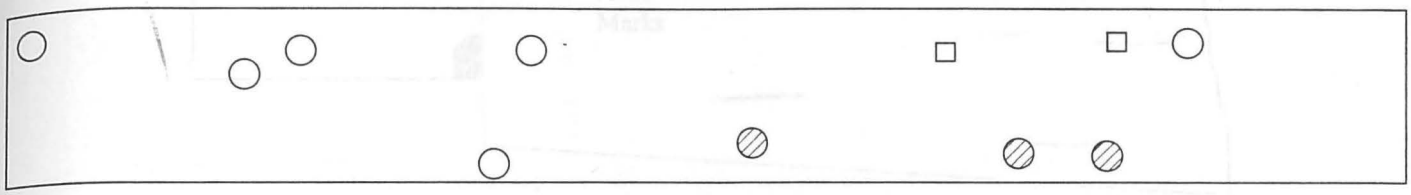


MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

Figure 28
Frame

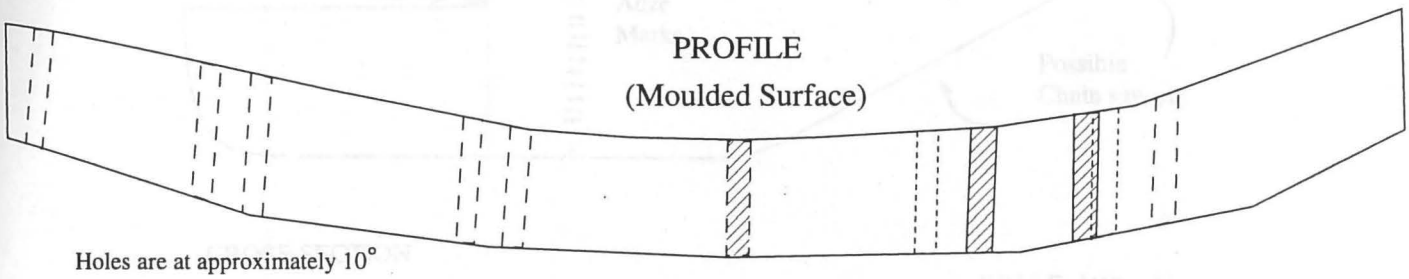
PLAN VIEW

(Sided Surface)



PROFILE

(Moulded Surface)

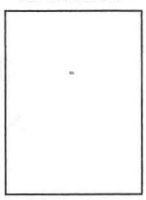


Holes are at approximately 10°

X-Section

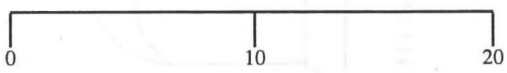
Chain Saw Cut

X-Section

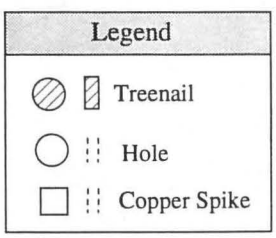


Chain Saw Cut

SCALE 1/4" = 2"

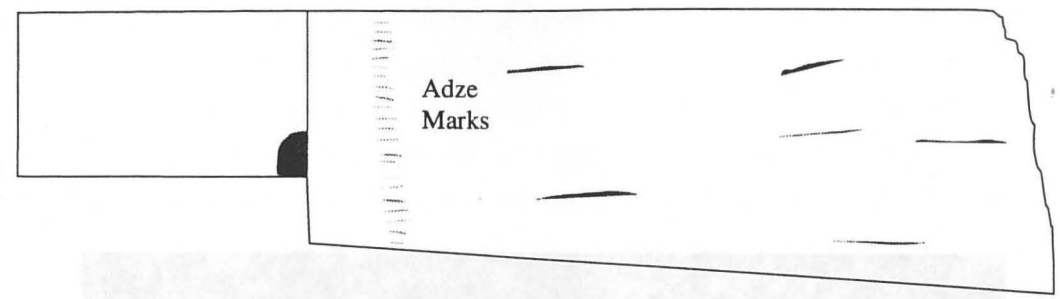


DRAWN TO SCALE

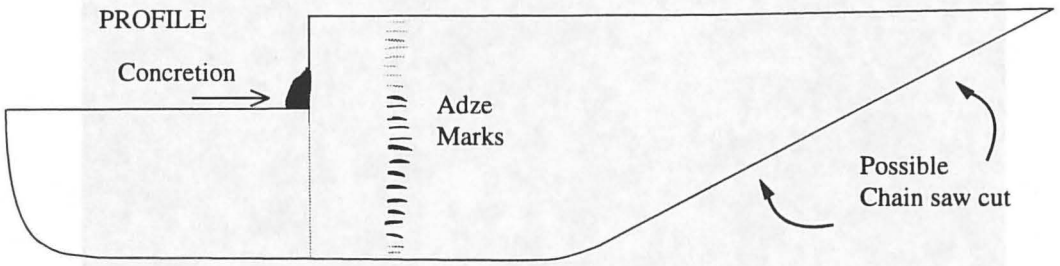


MUNI METRO TURNBACK PROJECT Documented Remains of Ship *Rome*	Figure 29 Frame

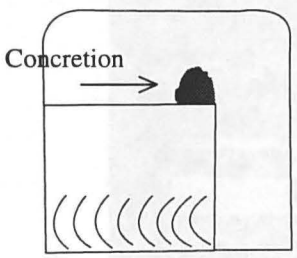
PLAN VIEW



PROFILE



CROSS-SECTION



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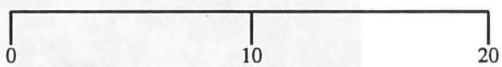
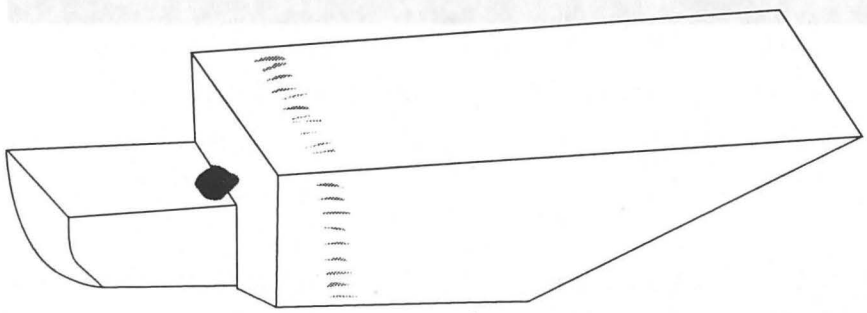


DRAWN TO SCALE



PERSPECTIVE (NOT TO SCALE)

MUNI METRO TURNBACK PROJECT Documented Remains of Ship *Rome*	Figure 30 Filling Piece

MUNI METRO TURNBACK PROJECT
SAN FRANCISCO, CALIFORNIA

William Self Associates
March 1996

Photo 15

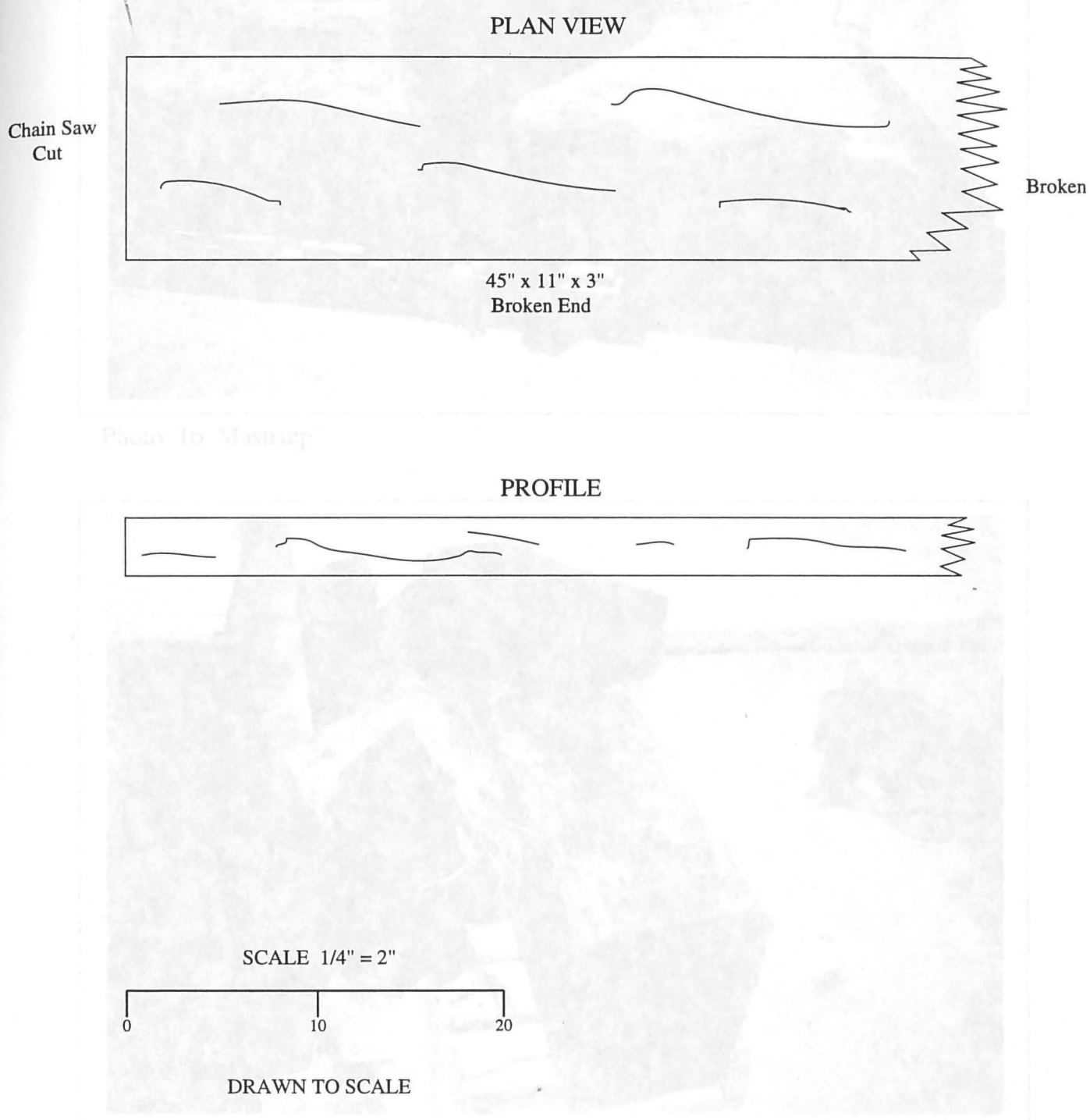
Filling Piece

The sided interior faces of the floors and futtocks were covered with spruce bilge ceiling planks that measured approximately 3 in. x 16 in. (Figure 31). The ship appeared to have fairly flat floors with very little deadrise. Consequently, once the excavation passed through the turn of the bilge, the ceiling planking, futtocks, and floors were encountered on a horizontal, rather than a vertical plane. The grinding tool (described above) was employed to pulverize these timbers, so little of the floors or first futtocks was recovered. Use of this tool was the most expedient method of advancing the excavation and it was used until the centerline of the ship was encountered. As destructive as the grinder was, numerous fragments of the ship timbers that lay outside the reach of the grinder were recovered on the surface. Unfortunately, most were found to lack any diagnostic potential. A few of the floor fragments and portions of the keelson exhibited evidence of having been burned, suggesting the low-burning, smokey charcoal fires typically used to "smoke" or fumigate a ship had been set in the limbers, between the floors. This would have allowed the smoke to travel between the floors, under the ceiling planking, to reach the dry habitat of vermin living above the bilge. This was the common method of fumigation in the age of sailing vessels.

The breasting of the tunnel face during most of the excavation, and the limited exposure of the hull that ensued, obscured most of the architectural details of the hull. Prior to the exposure of the centerline of the ship, what were later assumed to have been portions of the deadwood, apron, and forefoot were pulverized with the grinding tool. It was not until the keelson had been removed and the centerline passed that any perspective on these supporting timbers could be obtained (refer to Figure 7).

As described above, excavation of the ship was temporarily halted when the foremast at the centerline of the ship was exposed to allow WSA archeologists to take measurements. The foremast had been shaped from white pine and measured approximately 22 in. in diameter, a size in keeping with a vessel of 344 tons (MacGregor 1985). It was stepped on a keelson that measured 12 in. x 14 in. The lowest part of the mast containing the tenon was not recovered, although a portion of the keelson containing a mortise, possibly that of the maststep, was recovered on the surface (Photos 16, 17).

Resting on the keelson, immediately aft of the mast, was a mast chock, 8 in. thick. The chock disappeared into the matrix of the tunnel face so its width and length could not be determined. Below the mast, and resting on the ceiling planking at a 45 degree angle to the keelson, was the limber board, 10 in. in width, thickness undetermined (refer to Figure 8).



MUNI METRO TURNBACK PROJECT

Documented Remains of Ship *Rome*

Figure 31

Ceiling Plank

Exterior Surface Appears Burnt

Photo 16 Maststep

Photo 17 Maststep

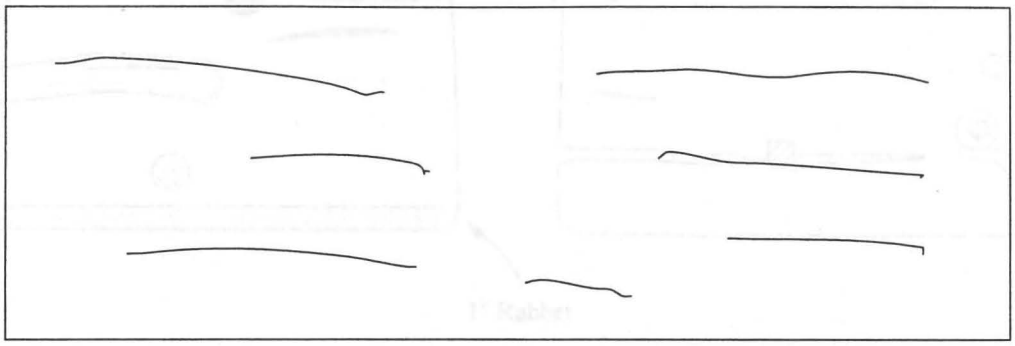
With the broader exposure of the tunnel face provided by the excavation of the foremast, the first evidence of the ship's deck was observed. Analysis of deck planking fragments indicated the deck was fabricated from 3 in. x 14 in. spruce planks (Figure 32). The exposed edge of the planks ran athwartships behind the foremast and appeared to have been roughly cut, suggesting the foredeck had been removed, prior to sinking, either in haste, or without a lot of attention to detail. The sand fill encountered inside the lower hull may have been introduced as a type of ballast prior to the vessel's sinking to insure a rapid and vertical descent. If so, the sand was probably deposited into the forecastle through the opening provided by the removal of the foredeck.

The ship's keel was fabricated from white oak and measured 13 in. x 17.5 in. Analysis of the keel fragments recovered on the surface indicate the keel had also been sheathed in copper. There was no evidence of a false keel. Residual tar and pitch on the moulded surfaces of the keel indicate a layer of this sealant was applied to the keel beneath the furring planks that lay underneath the keel's copper sheathing. The top of the keel was damaged during excavation, obliterating any evidence of the back rabbet. The remaining portion of the rabbet measured 3 to 3.5 in. (Figures 33, 34, Photo 18). The garboard strake was not recovered.

After the foremast was removed, a portion of a deckbeam was exposed immediately aft of the mast's position. The beam measured 12 to 14 in. sided and 12 in. moulded. A 6 in. notch, 3 in. deep had been mortised into the forward moulded surface to accommodate a mast partner or carling (Figure 35). The total width of the notch could not be determined as the deck beam had been cut prior to its observation, and the cut passed through the notch. A portion of a beam of similar dimensions, however, was recovered on the surface (Figure 36, Photo 19). That beam's uncut notch was identical to the partial notch observed in the deck beam found *in situ*. Although its provenience was lost, if the beam recovered on the surface is, in fact, the port side end of the same deck beam, the notch would have accommodated a parallel carling, which would have had a sided dimension of approximately 13.75 in., making it more likely the notch accommodated a pair of carlings. The carlings had apparently been removed with the foredeck. The starboard portion of the deck beam was not recovered on the surface, so analysis of the wood type was not conducted.

An unusual beam fragment was recovered on the surface during this portion of the excavation. Approximately 7 inches in both the sided and moulded dimensions, the beam was pierced through with a 3 in. x 9 in. mortise that had been lined with copper and fastened to the edge of the

PLAN VIEW

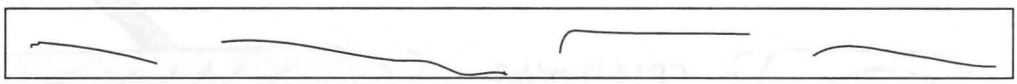


Chain Saw Cut

Chain Saw Cut

42" x 14" x 3.25"

PROFILE



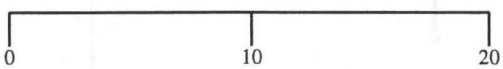
X-Section

Chain Saw Cut

X-Section

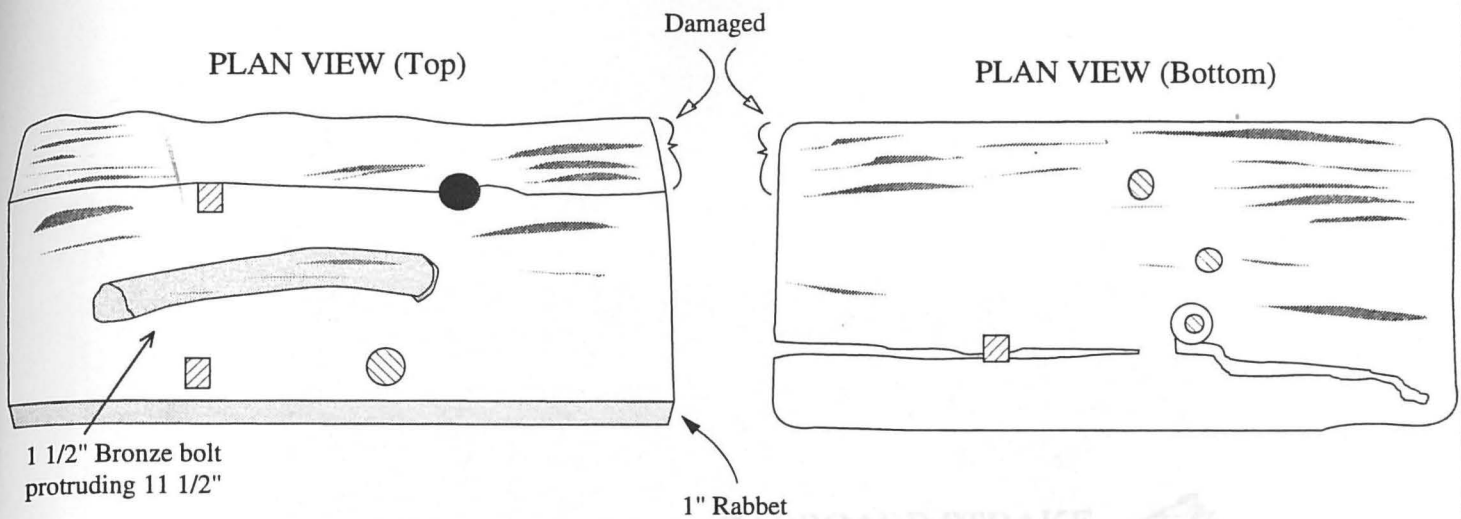
Chain Saw Cut

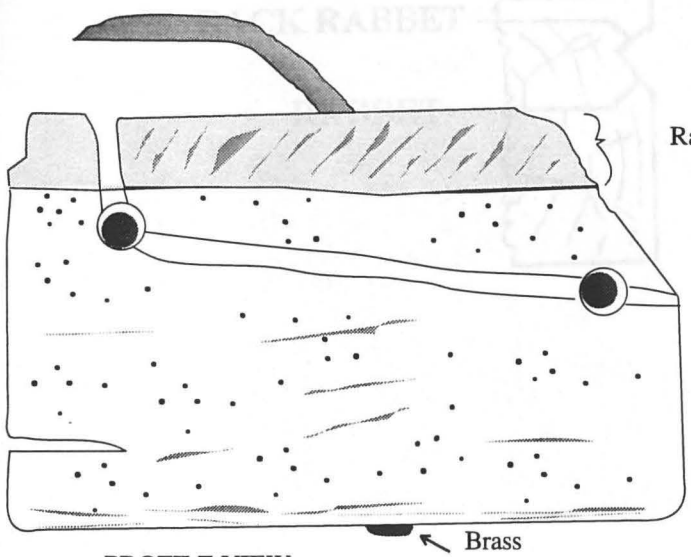
SCALE 1/4" = 2"



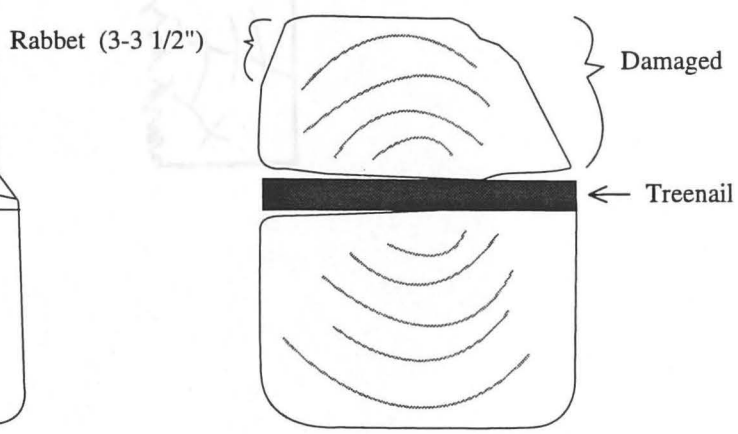
DRAWN TO SCALE

MUNI METRO TURNBACK PROJECT Documented Remains of Ship *Rome*	Figure 32 Deck Planking





PROFILE VIEW



CROSS-SECTION

Legend
Sheathing Nails
Treenail
Rove
Bronze Bolt
Square Bronze Spike (headless) 5/8" x 1/2"

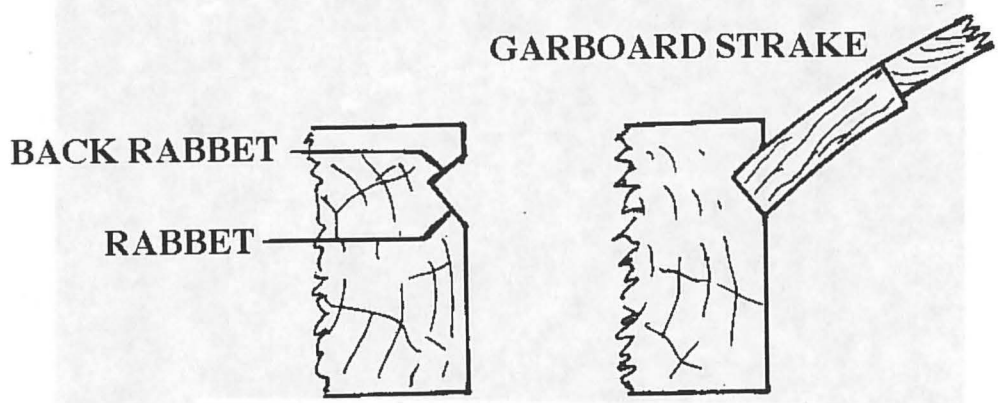
SCALE 1/4" = 2"

0 10 20

DRAWN TO SCALE

MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

Figure 33
Keel Segment



Not to Scale

MUNI METRO TURNBACK PROJECT
SAN FRANCISCO, CALIFORNIA
March 1996

Figure 34

Rabbet and Garboard Strake

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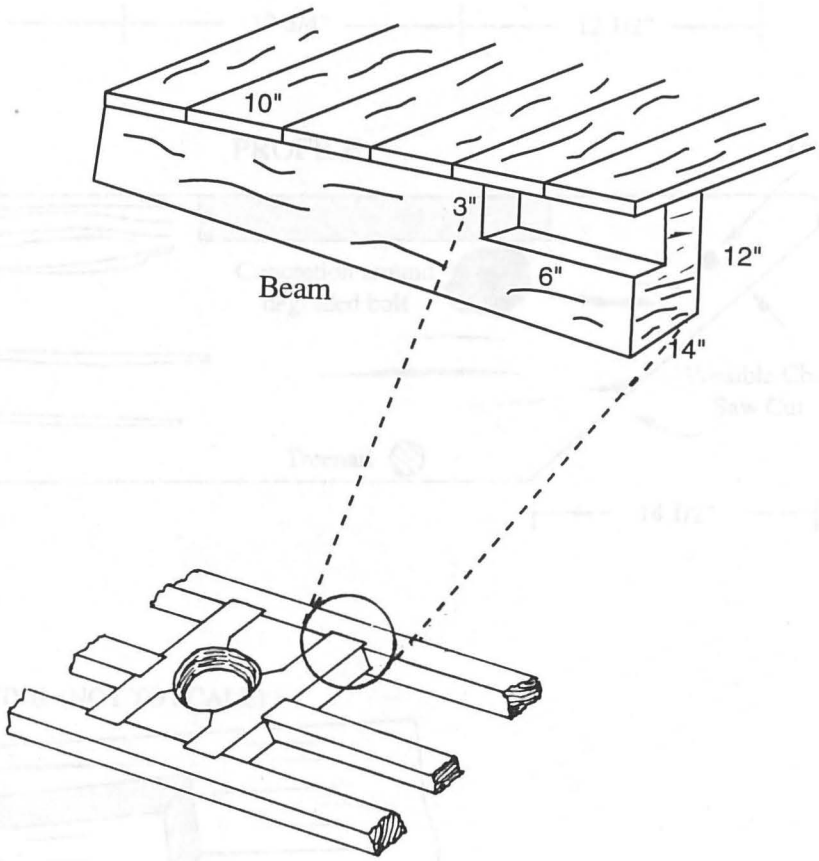
SAN FRANCISCO, CALIFORNIA

William Self Associates
March 1996

Photo 18

Keel fragment

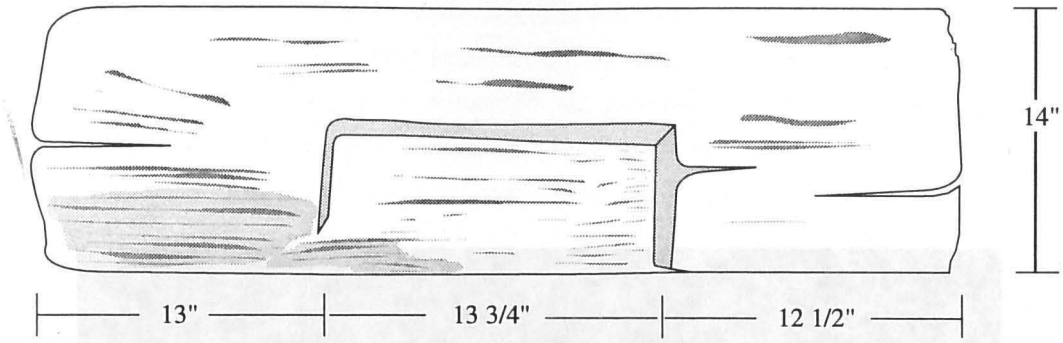


Not to Scale

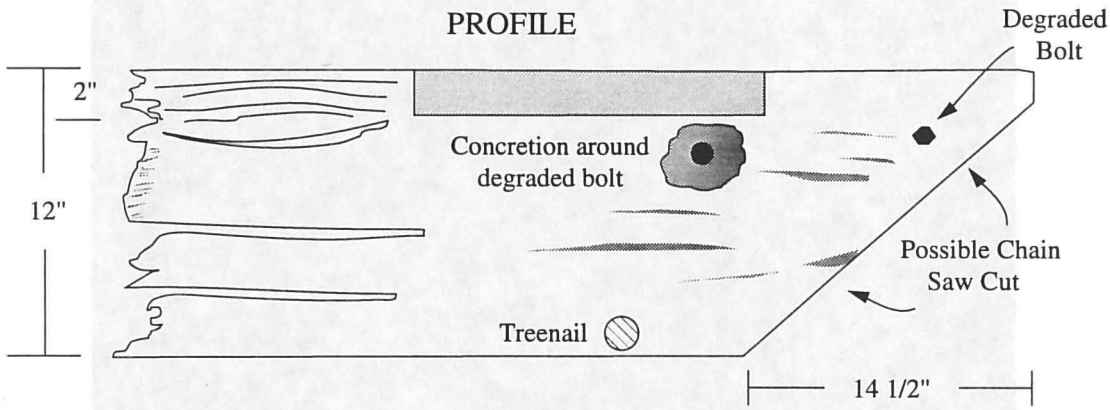
Source: Steffy 1994

MUNI METRO TURNBACK PROJECT Documented Remains of Ship *Rome*	Figure 35 Deck Beam

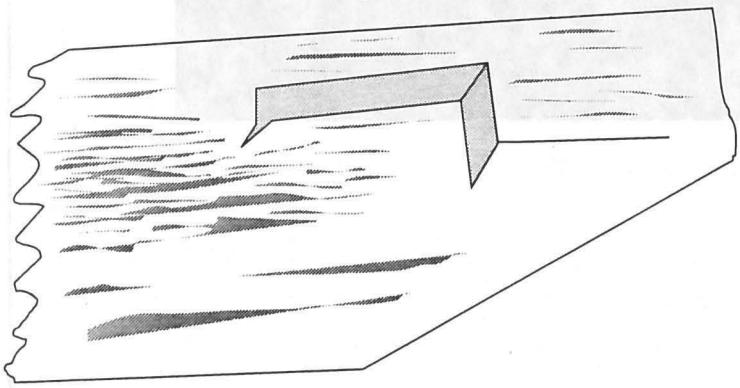
PLAN VIEW



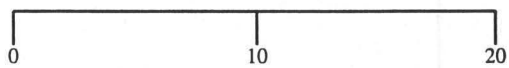
PROFILE



PERSPECTIVE (NOT TO SCALE)



SCALE 1/4" = 2"



DRAWN TO SCALE

MUNI METRO TURNBACK PROJECT Documented Remains of Ship *Rome*	Figure 36 Possible Deck Beam

MUNI METRO TURNBACK PROJECT
SAN FRANCISCO, CALIFORNIA

William Self Associates
March 1996

Photo 19

Possible Deck Beam

mortise with copper sheathing nails. A narrow groove surrounded the interior edge of the mortise on one surface. A hole consistent with that of a treenail passed through the mortise and the two copper lining plates, suggesting that something had been fastened into the mortise with a treenail on a horizontal plane (Figure 37). Although the provenience for this fragment was lost, it was recovered during excavation of the foremast area and may have been associated with the deck beams. It has been suggested that the mortise may have been covered with a lens that rested in the narrow groove, thus providing illumination to the forecastle (Gordon P. Watts, Jr 1996, pers. comm). If so, this beam may have been one of the carlings.

When the excavation reached the starboard side of the ship, a hanging knee and a lodging knee were recovered where the starboard end of the deck beam and the deck clamp met (Figures 38, 39; Photos 20, 21).

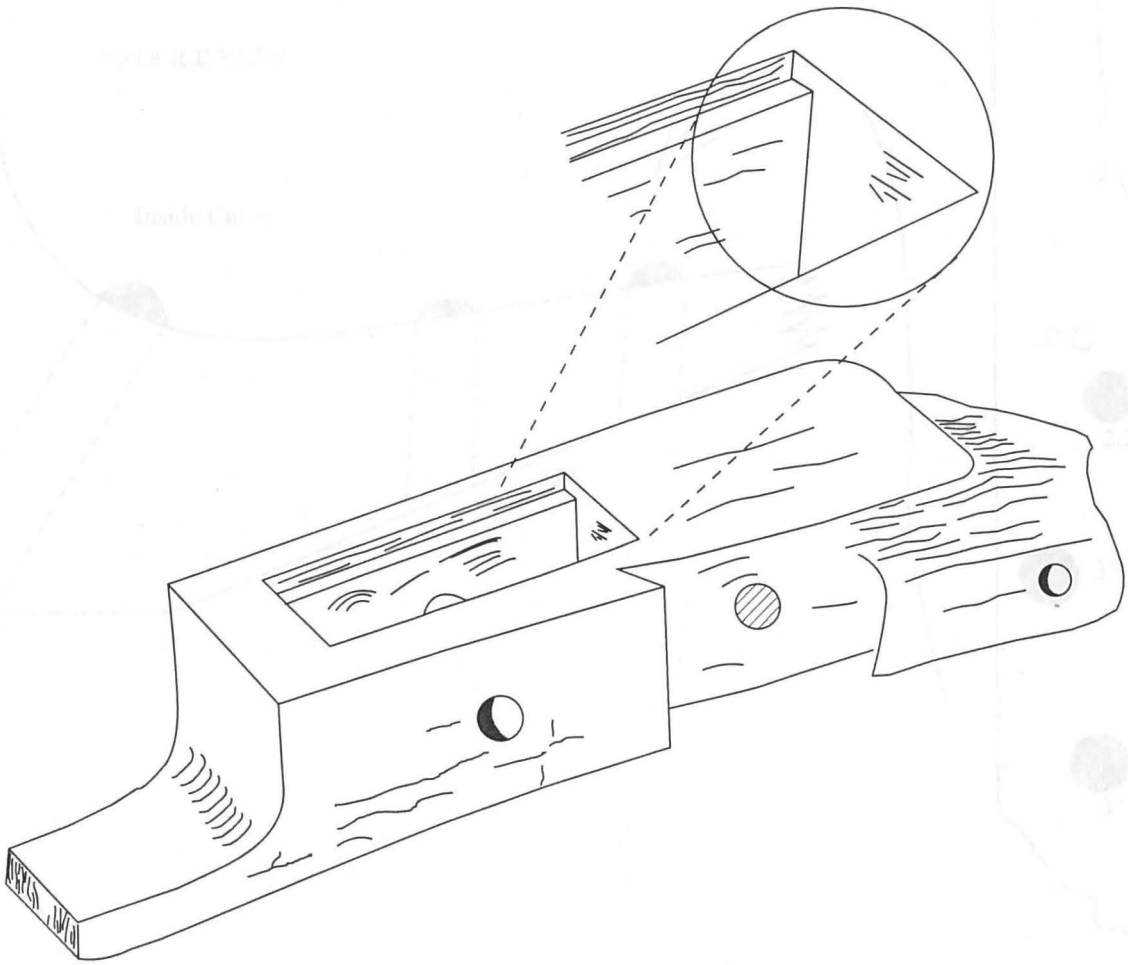
After the excavation crossed the centerline of the ship, the grinding tool was re-employed and little in the way of diagnostic hull components was recovered. Fragments of floors and futtocks, ceiling planking, hull planking, and furring planks were recovered from the excavation of the right and left sides of the tunnel face, areas beyond the reach of the grinder. As described above, these components were tagged in the tunnel face and recovered on the surface with moderate success. It was primarily these aforementioned parts of the hull's structure that were analyzed on the surface and are depicted in Figures 14 - 39.

5.3 Wood analysis

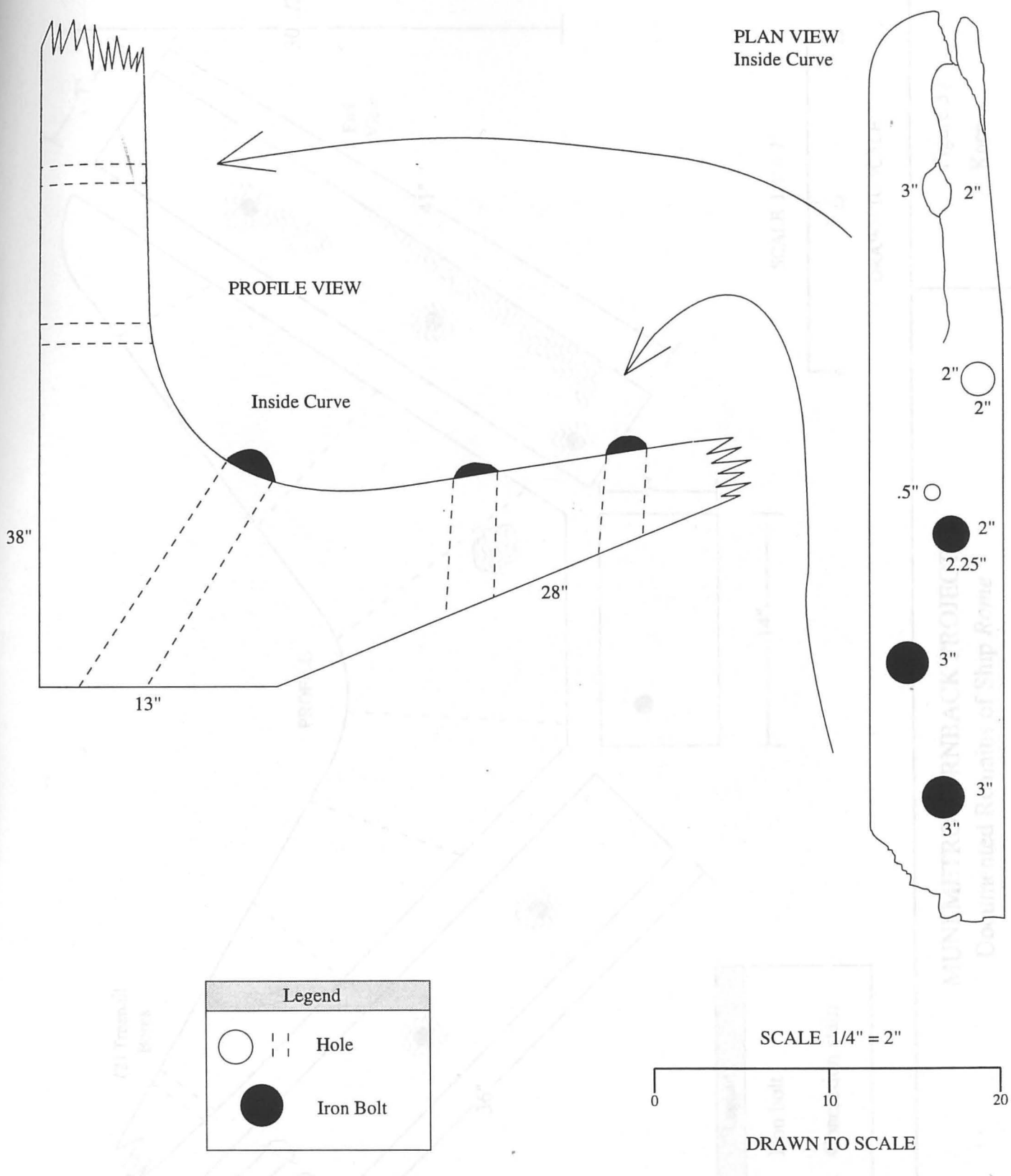
Analysis of wood samples taken from various hull components was conducted to correlate structural components of the ship with any historical documentation relating specifically to the construction of the *Rome* to aid in the ship's identification. It was also hoped that the analysis would provide some insight into Lawson's statement that the *Rome* was a "Russian hulk".

Species identification of the samples was made by Dr. Lee Newsom of the Center for Archeological Investigations at Southern Illinois University at Carbondale (SIUC) and by Mr. Harry C. Alden of the Center for Wood Anatomy Research (CWAR) at the U.S. Forest Product Laboratory in Madison, WI. The results of these analyses are depicted in Table 1.

Dr. Newsom's analysis on the question of the ship's origin suggests the ship was built on the east coast of North America:

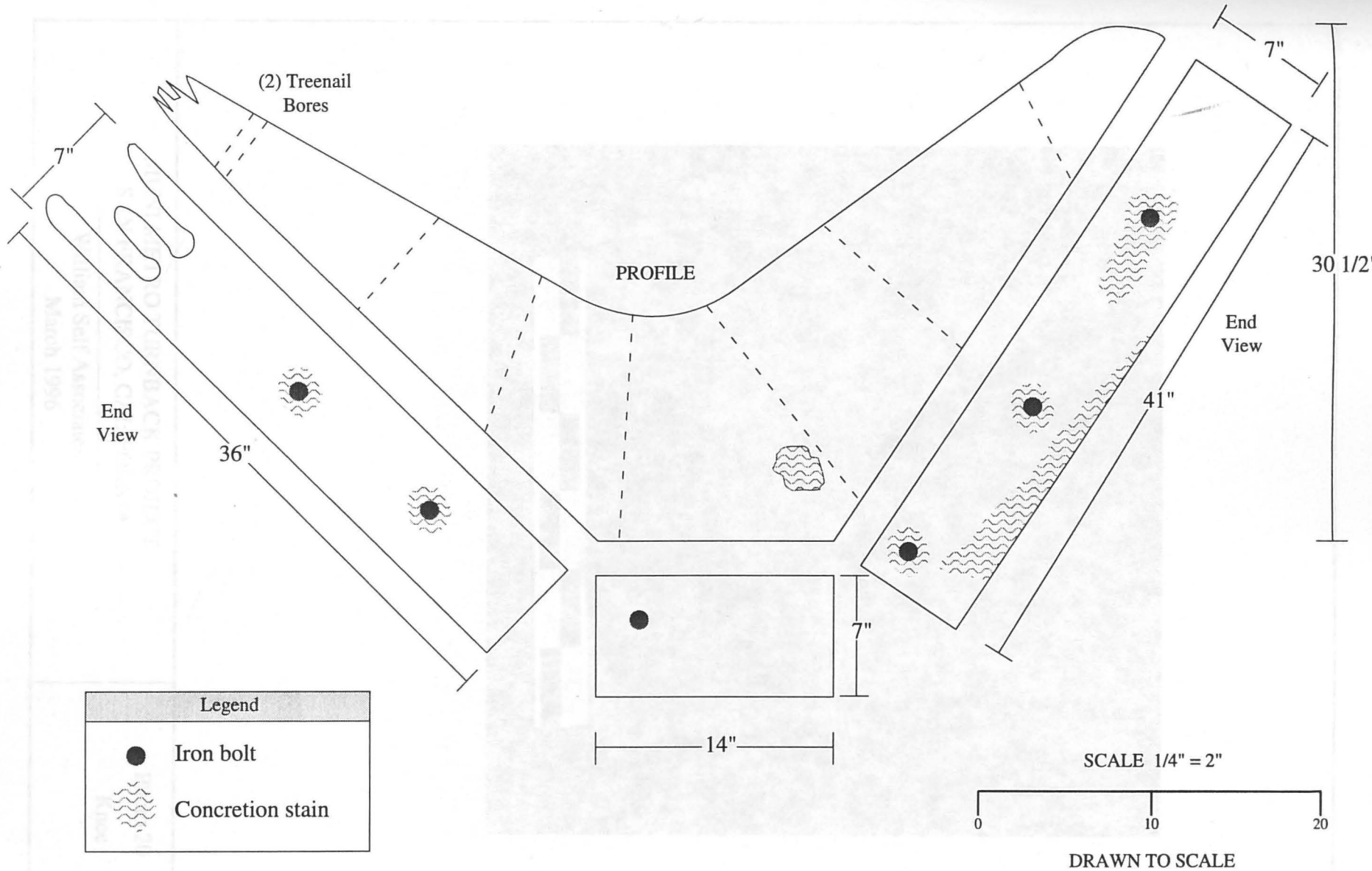


MUNI METRO TURNBACK PROJECT Documented Remains of Ship *Rome*	Figure 37 Deck Light?



MUNI METRO TURNBACK PROJECT
Documented Remains of Ship *Rome*

Figure 38
Knee



MUNI METRO TURNBACK PROJECT

Documented Remains of Ship *Rome*

Figure 39

Knee

MUNI METRO TURNBACK PROJECT SAN FRANCISCO, CALIFORNIA William Self Associates March 1996	Photo 20 Knee

MUNI METRO TURNBACK PROJECT SAN FRANCISCO, CALIFORNIA William Self Associates March 1996	Photo 21 Knee

. . .based on my experience with oak species used for ship building from North America and from Europe . . . your specimens are a very strong match for the classic white oak of eastern North America, *Quercus alba*, long used in American ship construction. . . . I feel a North American affiliation [for the ship] is very likely (Lee Newsom, September 1995, pers. comm.).

Table 1. Results of Wood Analysis

Component	Analysis by CWAR	Analysis by SIU@C
Mast	White pine (*Pinus* sp.)	n/a
Keel	White oak (*Quercus* sp.)	n/a
Frame	White oak (*Quercus* sp.)	White oak (*Quercus* sp.)
Deck planking	n/a	Spruce (*Picea* sp.)
Ceiling	Spruce (*Picea* sp)	Spruce (*Picea* sp.)
Hull Planking	White oak (*Quercus* sp.)	White oak (*Quercus* sp.)
Furring Planks	n/a	Probably juniper or red cedar (*Juniperus* sp.); possibly white cedar (*Calocedrus* sp.)

5.4 Description of Associated Artifacts

Aside from structural components of the ship such as bronze spikes and bolts, sheets of copper sheathing, sheathing nails, etc. that were recovered for their diagnostic as well as their interpretive value, little in the way of cultural material was recovered that could be definitely associated with the ship remains.

One hundred seventy-six artifacts recovered from on or within the ship have been entered into the project's artifact catalog.[4] Of these, 77 are ship's fasteners or representative fragments of hull structure and 99 are items classified as "cultural material". Of the 99 artifacts in the latter category, 78 are individual sherds of ceramic storage jars, representing approximately 13 individual vessels, reducing to 34 the actual number of artifacts classified as "cultural material".

[4] A catalog of artifacts recovered from the ship's excavation may be found in Appendix C.

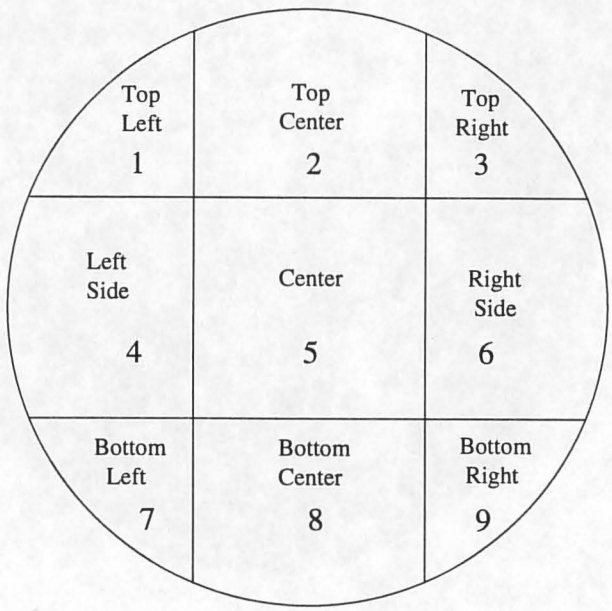
As discussed above, the excavation procedures restricted the archeologist's ability to determine provenience for the recovered artifacts. As the excavation was conducted 24 hours per day in four, six hour work shifts, archeological monitoring of the entire excavation was not practical.[5] Consequently, during the periods when archeologists were "on-call", the miners simply put aside many of the artifacts as they were recovered. These were later collected by the archeologists who recorded the date and approximate time of recovery. By consulting the records of the excavation's progress, it was occasionally possible to establish a gross provenience for some of the artifacts. To obtain this, the tunnel face had been divided into nine zones (Figure 40) that were used as vertical control references. Recorded progress through the ship was later correlated to the dates specific artifacts were recovered in order to provide a horizontal control for their location relative to the sides and centerline of the ship.

Appendix D contains a complete descriptive listing of all the artifacts recovered from the ship and entered into the general MMTP artifact catalog. The lack of visibility and the restricted access to the tunnel face (discussed above) made it impossible to positively ascertain a direct association of the artifacts with the ship itself. However, since all but a few artifacts were recovered from the upper portions of the sandy fill deposited in the forecastle, the artifacts appear to be intrusive and not associated with either the ship or its sinking. Only one artifact was recovered *in situ*. The intact ceramic olive jar or *botija* (#95-4-1546; Photos 22, 23) was recovered from directly behind the mast, resting on the deck's surface. Later correlation of this artifact with other stylistically and materially identical ceramic sherds (Photo 24) that were recovered from the secondary context of the fill in the forecastle suggests all the ceramics may have been deposited at approximately the same time and the intact specimen simply settled on the deck; this is likely to have occurred after the sinking of the ship.

While the artifacts recovered from within the ship are representative examples of 19th century material culture, they fail to shed any light on either the identification of the ship or its disposition prior to sinking (Photos 25, 26).

---

[5] An "on-call" protocol was developed with the approval of the SHPO and construction management in which a specific chain of command was established that identified the responsible parties and detailed the procedures that were to be implemented if significant archaeological finds or features were encountered while the archaeologists were absent from the site.



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March 1996

Figure 40
Vertical Control References

Photo 22 Olive jar (Botija)

Photo 23 Olive jar (Botija) - detail

Photo 24 Olive jars (Botijas)

Photo 25 Anchor ring

Photo 26 Ceramic jar fragments

6.0 INTERPRETATION OF THE RESOURCE

Although the exposure of the vessel was limited to an 18.5 ft. diameter bore through the ship's bow and forward areas, and despite the fact that none of the recovered cultural material appeared to be associated with the ship, several factors may be brought to bear on the issue of the vessel's identity. The most compelling of these is Lawson's recollection of sinking the *Rome* at what later became the corner of East [The Embarcadero] and Market Streets, the same location at which the tunnel excavations encountered the ship (refer back to Figure 13). Although he clearly made some factual errors regarding the scuttling of the *Rome*, they were relatively minor points and can be discounted in consideration of the fact that the story had been recounted some thirty-eight years after the fact.

Analysis of the wood used to build the ship suggests the keel, framesets, and hull planking were fabricated from a species of white oak native to the northeastern United States, the locale of the Salem shipyard in which the *Rome* was built. The ship encountered in the tunnel and the *Rome* were both three masted ships. The depth of hold of the ship measured 12 ft., almost exactly that of the *Rome*'s recorded depth of hold of 12.3 ft. (which would have been measured at the midship frame). Based on measurements extrapolated from Figure 9, the ship's beam would have measured approximately 25 feet, nearly identical to the 25.7 foot beam of the *Rome*.

Although absolute certainty in the matter is not possible, it would seem a reasonable assumption that the vessel encountered during tunnel excavations is, in fact, the gold rush-era ship *Rome*. Analysis of the historical record suggests the only other possibility is that the ship is the *Othello*. As discussed above, this is considered unlikely, especially in light of the fact that the 264 ton *Othello*'s beam measured 26.2 ft. with a depth of hold of 13.5 ft. (Stephen Canright 1994, pers. comm.).

7.0 SUMMARY

The Muni Metro Turnback Project benefitted from successful preconstruction environmental planning. It was understood that a Gold Rush-era sailing vessel might be encountered during tunneling, and adequate provisions were made for such an encounter. Under the constraints of the tunneling environment (a compressed-air setting, very tight working space, the need to

continue tunneling to keep the surrounding soil matrix under control, and the need to remove obstructions from an opening in the tunnel face of no larger than 5 feet in length and [generally] under two feet in width), archeologists were permitted access to the excavation, remains were documented *in situ* insofar as tunneling permitted, and the assorted physical remains were recovered from the excavated soil matrix once on the surface.

Although the remains of the *Rome* that have been recovered from the MMTP tunnel bore are fragmentary, and their integrity has been severely compromised as a result of the methods necessary to remove them from the tunnel face, it was nonetheless possible to identify them by ship component, and to reconstruct their role in what once comprised the intact hull of the ship. Core samples of the various components has provided valuable information on species of trees used in construction, and the components themselves amply illustrate the materials, workmanship and attention to detail indicative of the method of construction of this nearly 170 year-old ship.

We have the benefit of knowing exactly where this ship rests beneath Justin Herman Plaza, in both horizontal and vertical space. Although the bulk of the physical remains that have been recovered are not likely to retain sufficient integrity to warrant preservation, the remainder of the vessel, preserved as it is beneath the streets of San Francisco, would likely merit nomination to the National Register of Historic Places[6], and should be considered carefully in the planning of any future projects that may be undertaken in the immediate vicinity of the hull.

[6] The *Rome* is likely eligible for the National Register (36 CFR 60.4) under criteria (a), association with events that have made a significant contribution to the broad patterns of history, criteria (c), as it embodies distinctive characteristics of a type, period, or method of construction, and criterion (d), that it will yield information of importance to history.

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Appendix A

Letter to SHPO

Public Affairs Management

101 The Embarcadero, Suite 210
San Francisco, CA 94105
(415) 989-1446

☐ PLANNING/ENVIRONMENTAL PROCESS ☐ GOVERNMENT COMMUNICATIONS ☐ COMMUNITY RELATIONS

MEMORANDUM

DATE: December 3, 1994 - 11:30 am **VIA:** FAX/US MAIL

TO: Mr. Gary Reinoehl, Office of Historic Preservation

FROM: Mr. David A Sutter, SFPTC
Mr. Jim Allan, Principal Archaeologist

RE: Muni Metro Turnback Project - NRHP Section 106 Compliance - Notice of Discovery of Potential Significant Historic Property During Construction

This notice is being issued pursuant to Section 6.3 of the *Archaeological Monitoring and Data Recovery Plan, Final Research Design*, dated January 1994.

Please be advised that on Friday December 2, 1994, at approximately 12:35 pm (PST), partial remains of what appears to be a historic ship were encountered during tunnelling. Tunnelling operations were temporarily suspended to develop plans to safely advance the tunnel through the ship remains, and the principal archaeologist was notified and called to the site.

The Tunnelling Engineer has taken still photography and video of the tunnel face and ship remains encountered. These have been reviewed by the principal archaeologist who has identified the remains as a portion of a ship's hull and anchor. The ship's hull appears to be copper clad and partially fastened with either copper or bronze spikes.

The Construction Manger, Tunnelling Engineer and Principal Archaeologist met this morning (December 3, 1994) to determine Data Recovery procedures. In accordance with the AMDRP (Section 4.2, C.4.a-f), the Tunnelling Engineer has determined that construction activities must proceed with extreme limitations on standard archaeological techniques for data recovery. This is required to maintain work place safety and the physical constraints presented by tunnel construction techniques complicated by the special measures that must be taken to tunnel through the ship remains.

The Tunnelling Engineer and Principal Archaeologist have determined the following course of action pertaining to Data Recovery:

1) Detailed surveying, measurements, still photography and video taping of the ship remains present within the tunnel at this time will be conducted by Bechtel supervisory personnel Sunday, December 4, 1994, prior to resuming tunnelling.

2) As tunneling progresses, pieces of the ship remains will be removed in as large portions as possible, while still maintaining work place safety, (no larger than 2'x 4') for review by the Archaeologist outside the tunnel. Pieces will be marked for later correlation with a pre-disturbance map of the hull.

3) Periodic video tape and still photography will be taken as tunnel activity progresses to allow the archaeologist to correlate ship remains to locations within the tunnel.

The results of the data recovery will be provided to the Office of Historic Preservation within 60-days as required by Section 4.3 of the Research Design.

Per Section 4.3 of the Research Design, the Office of Historic Preservation will respond within 48-hours if not in concurrence with the plan. If SHPO is not in concurrence with this approach, please contact Mr. David A Sutter, SFPTC at (415) 554-0714 or by FAX (415) 554-1837

cc: Bruce Bernhardt, STU
Ray Sukys, FTA
Jim Connolley, Bechtel
John Overton, TSP
Scott Steinwert, PAM

Appendix B

Glossary of Ship Construction Terms

Glossary[1]

Apron A curved piece of timber fixed to the forward end of the keel and the after surface of the stem; an inner stempost.

Athwartships Across the ship from side to side; perpendicular to the keel.

Back rabbet The upper surface of a keel rabbet.

Beam The width of the hull; a timber mounted athwartships to support decks and provide lateral support.

Bilge The area of the hull's bottom on which it would rest if grounded; the cavities between the frames in the floor of the hold where bilge water tends to collect.

Breast hook A large, horizontal knee fixed to the sides and stem to reinforce and hold them together.

Cant frame A framing member mounted obliquely to the keel centerline in the ends of a vessel.

Ceiling planking The internal planking of a vessel.

Clamp A thick ceiling strake used to support deck beams.

Deadrise The amount of elevation of the floor above the horizontal plane.

Deadwood Blocks of timber assembled on top of the keel, usually in the ends of the hull, to fill out the narrow parts of a vessel's body.

Floor A frame timber that crosses the keel and spans the bottom; the central piece of a compound frame.

Forefoot A curved piece between the forward end of the keel and the knee of the head.

Foremast The forward-most mast nearest the bow.

Frame A transverse timber, or assemblage of timbers, that describe the body shape of a vessel and to which the planking and ceiling were fastened.

Furring plank A thin covering of wood applied to the hull planking, beneath the copper sheathing, used to stabilize and support the sheathing.

Futtock A frame timber other than a floor timber; one of the middle pieces of a composite frame.

Garboard strake The strake of planking next to the keel; the lowest plank.

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[1] Most definitions from Steffy 1994

Hanging knee A vertical angular timber used to reinforce the junction of a beam and the side.

Hull planking The outer lining, or shell, of the hull.

Keel The main longitudinal timber of the hull upon which the frames, deadwoods, and ends of the hull are mounted; the backbone of the hull.

Keelson An internal longitudinal timber, mounted atop the frames along the centerline of the keel, that provides additional longitudinal strength.

Limber board Ceiling plank next to the keelson which could be removed to clean the limbers.

Limbers Watercourses or channels alongside the keel through which water could drain into the pump well.

Lodging knee A horizontal, angular timber used to reinforce two perpendicular beams or the junction of a beam and the side of the hull.

Mast chock A reinforcing block situated behind the mast, on top of the keelson.

Moulded The vertical surfaces (the sides) of the keel, keelson, frames, etc.

Port The left side of a vessel when facing forward.

Rabbet The grooves cut into the sides of the keel, stem, and stempost, into which the garboards were seated.

Sheathing A thin covering of copper to protect the hull from marine life or fouling.

Sided The dimension of an unmoulded surface; the distance across a frame's surface, or the upper surface of the keel or keelson.

Starboard The right side of a vessel when facing forward.

Stem A vertical or upward curving timber, or assembly of timbers, scarfed to the forward end of the keel, into which the two sides of the bow are joined.

Treenails A round or faceted piece of hardwood, driven through planks and timbers to connect them.

Turn of the bilge The outboard part of the lower hull where the bottom curves toward the side.

Appendix C

Catalog of Artifacts

APPENDIX C.
ARTIFACTS RECOVERED FROM EXCAVATION OF *ROME*

TYPE	SUBTYPE	QUANTITY	ATTRIBUTED DATE	DESCRIPTION
Ceramic	Cv	1		Portion of white glazed ceramic with blue (wedgewood-style) relief floral design. No maker's mark. No reference for this ware found.
Ceramic	J	1	1780-1850	Coarse earthenware *botija*, or Olive Jar, late style. Hand coiled, round base. Cream slip on the body. Ring neck and mouth has sloppily-applied blue/grey glaze. The primary use for these vessels was to store goods, particularly liquids, and to transport them. Unglazed varieties could have been used for storing water, as the unglazed, porous sides would have promoted evaporation, and cooling. (Deagan 1987: 31-32)
Ceramic	J	1		Large hand coiled water jar (*botija*) Buff ceramic with buff slip on the outside. The neck, rim and inside have a brown glaze. No markings.
Ceramic	J	1		Large hand coiled olive jar (*botija*). Buff ceramic with buff slip on the outside. The neck, rim and inside are glazed. No markings.
Ceramic	J	10		Body portions of wheel-thrown, ceramic olive jar (*botija*). Exterior is unglazed, light buff color and interior is sporadically covered with a dark gray wash or glaze. No rim or neck portions, so impossible to determine exact style of jar. Judging from the glaze and exterior color, all of these sherds are probably from the same jar.
Ceramic	J	2		Two bases and partial bodies of heavy ceramic jars. Jars were wheel thrown, made of red clay with a brown glazed interior and a reddish/cream slip on the exterior. These jars are very thick (3/4')as opposed to lot 3021-3 which are 1/2" thick. No marks.
Ceramic	J	10		Sherds of wheel thrown pottery jars. Red clay with a red/cream slip on the outside and brown glaze on the inside. The rim and the area of the neck on the outside are not glazed.
Ceramic	OC	1		Partial, overseas Chinese ginger jar body and rim. Body portion has white slip with faint horizontal blue/gray lines. Rim is light brown with no glaze. Interior surface is sloppily covered with a cream colored glaze. Lister and Lister (1989:43) show a similar jar and state that it is made of a ". . . distinctive light-firing clay containing iron particles that caused speckling . . . ".
Ceramic	Cp	1	1844 - ?	Partial flow blue decorated cup. Floral decoration includes a scene with two oriental women; no reference for this design found. Partial maker's mark on base; "AMOY" enclosed within a geometric design, above "DAV..." indicates Davenport, Longport, England which was in operation from 1793 1887 (Godden 1964:189). Praetzellis et al. (1983:30) shows a similar mark and offers a manufacture date of 1844 - ?.

APPENDIX C.
ARTIFACTS RECOVERED FROM EXCAVATION OF *ROME*

TYPE	SUBTYPE	QUANTITY	ATTRIBUTED DATE	DESCRIPTION
Ceramic	J	1		One body portion of a wheel-thrown, ceramic olive jar (*botija*) Exterior is unglazed, light buff color and interior is covered with a dark gray glaze. No rim or neck portions so impossible to determine exact style of jar. The ware is unusual as it appears to have three separate layers; the exterior, is a light buff layer which ranges in thickness from .1 cm to 3cm, the next layer is black clay which varies in thickness from .2cm to .4 cm, the third layer is orange clay which varies from .5 to 1.0 cm in thickness. The final interior layer is a dark gray glaze.
Ceramic	J	9		Nine body portions of a wheel-thrown, ceramic olive jar (*botija*). Exterior is unglazed, light buff color and interior is covered with a mottled, dark gray glaze. No rim or neck portions so impossible to determine exact style of jar. Judging from the glaze and exterior color, all of these sherds are probably from the same jar.
Ceramic	J	23		Twenty-three body portions of a wheel-thrown, ceramic, olive jar. (*botija)* Exterior is unglazed, light buff color and interior is covered with a mottled, dark gray glaze. No rim or neck portions, so impossible to determine exact style of jar. Judging from the glaze and exterior color, all of these sherds are probably from the same jar.
Ceramic	J	4		Four rim portions from wheel-thrown, ceramic, olive jars (*botija*). Rim exteriors are covered with a crazed, dark gray glaze. The interior surfaces of the rims are predominately unglazed, although some of the glaze has run in from the exterior. The lack of glazing on the interior rim surfaces was probably intended to facilitate the cork closures used on this type of container. The exterior glaze on one of the rims runs just to the base of the rim; the body portion is unglazed. The rims appear to match Deagan's description of a late-style ring neck, as they are all ". . . a simple ring or 'doughnut' shape attached directly to the body of the jar" (1987:35)
Ceramic	J	3		Three ceramic body portions that are possibly ceramic olive jar fragments (*botija*). These fragments have the same overall construction as the other olive jar fragments found at CA-SFR-127H, but are much thicker. The body thickness varies from .7 cm to 2.6 cm. The unglazed exterior surface is light buff in color. The interior has a mottled dark brown glaze. The lack of base and rim portions makes identification of the exact shape and style impossible.
Ceramic	J	2		Two body portions from ceramic olive jars (*botija*) The unglazed exterior surface is light buff in color. The interior has a mottled dark gay glaze. The lack of base and rim portions makes identification of the exact shape and style impossible. Judging from the glaze and exterior color, all of these sherds are probably from the same jar.

APPENDIX C.
ARTIFACTS RECOVERED FROM EXCAVATION OF *ROME*

TYPE	SUBTYPE	QUANTITY	ATTRIBUTED DATE	DESCRIPTION
Ceramic	J	7		One unusual shape from CA-SFR-127H site is represented by seven ceramic sherds. The body construction is quite similar to the other olive jar (*botija*) portions but the rim extends vertically from the neck and is quite unlike any of the other rims collected from the site or illustrated in the literature. The unglazed exterior is a light orange-buff color, the interior has no apparent glaze but there is a dark "wash" that covers most of the ware.
Ceramic	J	2		Two specimens are base and partial body portions that are more elongated in shape and have almost flat bases. It is difficult to accurately assess these two specimens, as the neck and rim portions are missing and the exact body shape cannot be determined. However, they appear to match the style designated Type A by Marken (1994:133). Both of these specimens match the later (18th century) Type A style rather than the early (16th to 17th century) Type A styles.
Ceramic - bottle	S	1		Portion of a ceramic bottle impressed with "FACHINGEN" encircling an animal (lion?). No reference for this mark found.
Glass - bottle	P	1	pre - 1865	Small, clear, polygon style, perfume (?) bottle. Neck and finish are missing. No embossments. Blowpipe pontil scar on base indicates pre-snap case manufacture; probably before the mid-1860s (Munsey 1970:48).
Leather	S	1		Piece of a shoe sole.
Metal	N	3		3 small copper sheathing nails with fragment of copper sheathing around each head. Recovered from ship's hull, used to fasten copper sheathing to hull.
Metal	Sh	1		Four sided, flat head copper nail.
Metal	Sh	1		Iron spike. Can't tell about type of point (too rusted).
Metal	Sh	1		Fragment of iron mast strap.
Metal	Sh	1		Piece of copper sheathing taken from the keel area of the ship. Has nail holes.
Metal	N	1		Round copper bolt.
Metal	N	1		Large square spike with flat head.
Metal	Sh	4		Four pieces of copper sheathing, with nail holes.

APPENDIX C.
ARTIFACTS RECOVERED FROM EXCAVATION OF *ROME*

TYPE	SUBTYPE	QUANTITY	ATTRIBUTED DATE	DESCRIPTION
Metal	Sh	10		8 pieces of a bronze bolt used to hold the floors to the keel. These pieces were cut from the keel.
Metal	Sh	1		Piece of degraded iron.
Metal	Sh	2		2 pieces of copper bolt. One is 1' diameter the other is 3/4', both came from the ship, most likely from the bottom center (keel area).
Metal	Sh	1		Flat piece of cast steel with stamped maker's mark: 'JOHN LORD & CO' above 'CAST STEEL' No date.
Metal	Sh	2		Two pieces of copper sheathing and 19, small, copper nails.
Metal	Sh	1		One piece of copper/bronze bolt from the keel area of the ship.
Metal	Sh	5		Four copper nails. One square nail and 3 small round head sheathing nails. Two small pieces of sheathing with nail holes.
Metal	Sh	1		One piece of a degraded iron spike.
Metal	Sh	1		Round piece of degraded iron. No markings.
Metal	Sh	1		Part of an iron anchor? Top ring and part of the shaft.
Metal	Sh	1		One square bar of iron, could have been a spike or possibly something else. No marks
Metal	Sh	8		Copper sheathing nails, eight round and one square.
Metal	M	1		Large saw blade, appears to be from saw mill. Corroded and slightly bent. Recovered from within ship's hull but provenience unknown. Turned in by miner. Probably intrusive.
Wood	Sh	1		Wood treenail. No marks.
Wood	Sh	1		Piece of wood (Futtock? Keel?) with wooden treenail inserted through it. No markings.
Wood	Sh	1		Piece of sacrificial planking with copper sheathing and small copper nails.
Wood	Sh	1		Wooden mallet head with wooden handle.
Wood	Sh	1		Piece of wood with copper spike in it.

APPENDIX C.
ARTIFACTS RECOVERED FROM EXCAVATION OF *ROME*

TYPE	SUBTYPE	QUANTITY	ATTRIBUTED DATE	DESCRIPTION
Wood	Sh	1		Round plug?
Wood	Sh	1		Keel with sacrificial planking, copper sheathing and copper nails.
Wood	Md	4		4 pieces of wood which appear to be part of a barrel. One pieces is flat and round and may be the top or bottom. Two pieces are rectangular with rust spots on the surface from the decomposition of metal nails or rivets. The last piece is long and round, function unknown.
Wood	Sh	1		Piece of futtock with small copper nail.
Wood	Sh	1		Wood futtock, with holes for treenails or bolts.
Wood	Sh	4		Four pieces of treenails, various lengths.
Wood	Sh	1		Wood block from between ship frames.